

THE green scene

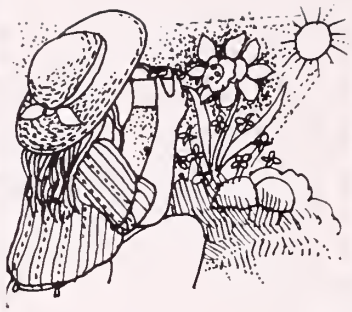
HORTICULTURE IN THE DELAWARE VALLEY

SEPTEMBER • OCTOBER 1981 $1.50

Breezewood – A Garden and Cultural Center in Maryland. See page 13.



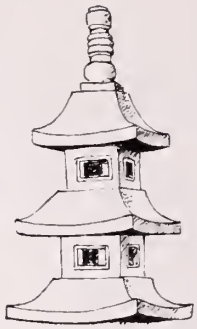
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Front Cover: Part of the Japanese Garden at Breezewood. Plants in foreground are trained to bonsai-like forms. Foliages are selected for their interplay of textures, shapes and variations of green. See page 13.
photo by Duane Suter

Back Cover: photo by Barbara Bruno

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THE
green scene
HORTICULTURE IN THE DELAWARE VALLEY

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Magazine vs. Machine:
Going into The Green Scene's *10th Year*

EDITORIAL

by Jean Byrne

Ten years ago, when we were working on the first issue of *Green Scene,* a communications consultant whom I know wrote confidently that magazines were on their way to obsolescence. This judgment anticipated the painful demise of *Life, Look,* and several other general interest magazines. My friend added "Except for specialty magazines." That addendum was and is good news to photography, gourmet, and other well-managed specialty publications including horticulture. Now comes another prediction. Each home, say the futurists, will shortly have a computer that will call forth any and all kinds of information about cooking, gardening, chess, shopping and whatever else is classifiable.

I find myself somewhat resistant to that mode of information dissemination. What happens when the horticulturist curls up in bed at night to read about a special garden three communities away? Do you tuck the home terminal on your tummy and hope the blipping perennial lists won't bother your partner. Or the next morning do you tuck the machine in your natty paper thin executive carrying case or Gucci purse, pull it out on the train and hope it doesn't gurgle, groan or burp too unceremoniously in the train's aisle as you search for your winter's schedule of planting materials.

Will the machine allow for the variations of style between writers that we have become accustomed to – from the elegant, measured writing of an Ed Peeples or Fred Ballard, the warmth of Mary Lou Wolfe, or the enthusiastic, rough and tumble style of four-year-old Pierre Radebaugh featured on page 4 of this issue. Will it allow for the inconsistencies of quality in photographs – from the dreaminess of a Barbara Bruno or preciseness of a Wilbur Zimmerman to the slapdash, but lucky for us, record keeping of an untrained photographer who lets us glimpse a winter garden that we might otherwise not have except from their one of a kind files.

Can a machine align with the special goals we set up 10 years ago when we started to launch *Green Scene:* to instruct (yes); to share (possibly) and to create a stronger community of horticulturists (no). That is to reach people who belong to the Society, but who perhaps have never been to or will never visit the headquarters, or who for some reason or other have never visited the Flower Show. People who passionately nurture

Do you tuck the home terminal on your tummy and hope the blipping perennial lists won't bother your partner?

into life every seed they can lay their hands on. Or the timid gardener, who is uncertain, whose advice, until they received *Green Scene,* came from the clerk in the plant store, or perhaps even from labels on plants in the supermarket.

Horticulturists are special people. They are consciously in tune with the cycles of life: they are observant, conserving, sharing. They are moved most privately by a blossom or publicly by a panorama. Horticulturists remind klutzes not to trample the tiny precious wayside flowers; they encourage people to enliven their neighborhoods with trees or plantings of impatiens in tires or windowboxes; they transform littered lots into sitting parks or vegetable gardens. In other words they speak with myriad voices, about myriad subjects. They have perspectives, imaginations, spiritual or sensual impulses that can be expressed easily in the printed word – words that are stored in our wallets, tacked on our shed doors, or clippings passed from friend to friend.

The purpose of *Green Scene* at the beginning of its second decade continues to be to cross lines – to have the bonsai specialists and rock gardeners cross fertilize with ideas, to have city and suburban gardeners discover whole new ways of working with plants from each other and to have indoor and outdoor growers inspire and stimulate each others' notions about the possibilities in gardening.

Perhaps it is reactionary of me, but it's a joy to know that people have saved *Green Scene* since its inception. Ten microfiches would never satisfy me as do the bright red, numbered volumes of past *Green Scenes* with their tidy indexes, that sit on my desk. No instant recall of an article on a dispassionate machine will ever satisfy me as much as the interest of a horticulturist who leafs through *Green Scene* with its array of articles for the first time.

We want to continue to be guided by our instincts and our gut reaction to plants, not too dependent for that guidance upon machines. If we are publishing what you want, that's great. If we are not, let us know. Call me at 215-625-8254 and tell me what you would like to see, and we'll publish the stories you want.



GROWING

by PIERRE as told to Jane Lennon

planting

Do you know how to plant pumpkins? I made a little hole and I put a pumpkin seed in. Made a little dome over it and I squashed it down flat. They came up green as peas and Mom thought they were cucumbers.

growing



This seed is very magical. It doesn't look like a pumpkin is in it.



Dip the water from your wading pool and put it on your pumpkin garden. Pumpkins get hot and thirsty too.



So much stuff was growing there, I almost couldn't see the garden.

PUMPKINS

photos by Patrick Radebaugh



This one leaks, it smelled horrible. It had a tiny hole near the top. Then a little worm popped up and plugged the hole with pumpkin gook. It is his home but it isn't nice anymore.

At the Harvest Show they do not have chocolate houses for prizes. I thought they did.

showing pumpkins

To go to the Harvest Show you have to take your pumpkin there before breakfast. I brought a pretty little pumpkin which I loved entirely. I gave it to some people at "The Juniors." Then I ate breakfast outside near the cannon, then went to school.





Someone came when no children were there and gave us ribbons. They are probably friendly people, but we don't know who they are.

At the Harvest Show they do not have chocolate houses for prizes. I thought they did. They had pumpkins as big as America. Mom, if we left our pumpkins in the garden till next year could we get Big Mac pumpkins, big enough to get inside of?

After the Harvest Show you can make a halloween or you can eat the pumpkin and take the prize to Show and Tell at school.

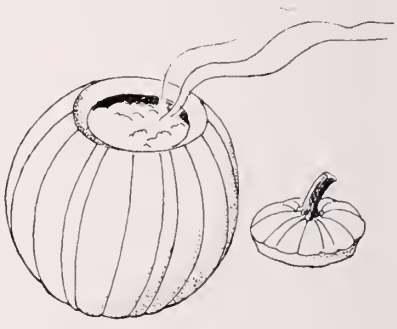
eating pumpkins

Mom, are pumpkins tasty when they are not pie, too?

Best Pie in a Pumpkin Shell

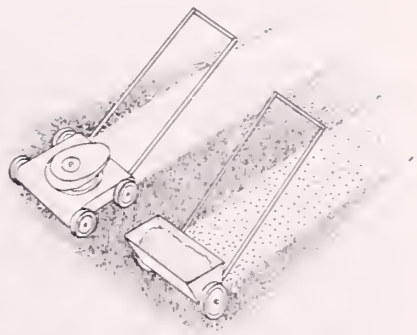
Saw off the top of the pumpkin and cut a little hole in the top to let the steam out. Dig out all the seeds. Put in sugar and syrup and butter* and cook it into a pie. Tastes so fine!

*Also put in pumpkin: apple, or pared pumpkin chunks and/or nuts, or some mincemeat. Put on pumpkin's lid and bake it in 350° oven, with the pumpkin sitting in a pan of water (about 1 in. deep). Cook for about 1 hour, 9 or 10 in. pumpkin. Serve warm with custard, whipped cream or vanilla ice cream.



Pierre Radebaugh is four years old. His 1980 pumpkins were planted in Philadelphia. His 1981 crop is growing in Morgantown, Pa., at his family's new farm. He hopes to see you and your pumpkins at the Harvest Show at Memorial Hall, September 25, 26 and 27.

Most Lawn Weeds Best Controlled This Fall



by James J. McKeehen

Will your lawn look like many of the neighbors' next spring, dotted with the yellow blooms of dandelions? Will your bluegrass be intertwined with the white flowers of creeping chickweed plants? Will there be a good stand of hawkweed, ground ivy, buckhorn plantain, veronica and other viny or broadleaf weeds? If you can nod affirmatively, please read on; this article was written with you in mind. Don't think you are the only owner of an outstanding collection of all the lawn weeds pictured on the charts near the lawn herbicides in the local garden center. Many people are right there beside you.

September, October, and early November are the best time of year to control most of the broadleaf and viny-type weeds that invade home lawns in the Delaware Valley. Many of them are young and just getting a nice start in the fall, waiting to bloom and produce viable seed the following spring. So take advantage of their young vulnerable state and wipe them out before they crowd out some of your prize bluegrass or fescue lawn plants.

Before you learn how and what to do, you should understand a few key principles of lawn management so your efforts aren't wasted. The best lawn weed control is the development of a dense stand of desirable grass. Weeds won't invade a thick, vigorous growing turfgrass area as easily. Owning a dense sward can best be managed by mowing properly and adequately fertilizing.

Mowing should be done at frequent intervals; never permit more than half of the cutting height to be produced before you mow again. For example, the best height to set a lawn mower (i.e., rotary, reel, hammerknife) is two inches. Therefore, whenever about one inch of grass growth occurs following a mowing, it is time to mow again. Continue mowing until growth stops at onset of cold weather. This method prevents a thin stemmy turf.

when to fertilize

Fertilizing will produce the dense stand of turf that helps to control weeds. Fertilize your lawn this fall sometime between September 1 and September 20. Select a high quality turf grade fertilizer containing slowly available nitrogen as well as phosphorous and potassium. A typical grade of lawn fertilizer is 10-6-4. Your lawn needs twice as much nitrogen as phosphorous or potassium. In addition, at least 25% to 35% of the nitrogen should be in a slow release form, water insoluble nitrogen (W.I.N.). Read the label on the bag carefully; by law if the manufacturer claims any slowly available nitrogen, the label will tell you the pounds or percentage of water insoluble nitrogen. You should apply about 2½ to 3 lbs. of actual nitrogen per 1,000 sq. ft. of lawn area and about half that amount of phosphorous and potassium. Using a 10-6-4 turf grade lawn fertilizer as an example, this calculates out to 25 to 30 lbs. of fertilizer per 1,000 sq. ft. There are many different grades or analyses of turf grade fertilizer in the marketplace. Simply use the above example as a guide. Choose your favorite brand, check the label for W.I.N., do your fertilizer arithmetic, spread it on before September 20 and you're in business.

Now that you are mowing properly and you have a dense, well-managed turf, you have the most effective deterrent to weed encroachment. Weeds penetrate a turf area only if the grass is sparse and offers minimal competition to the weeds.

chemical control

When chemical weed control is necessary, first identify all the different weeds present. Next, select the herbicide or herbicides recommended for these weeds. Read the label and apply the chemical or chemicals at the correct rate according to manufacturer's recommendation. Broadlead and viny weeds die slowly (two to five weeks, depending on the temperature). Treatments should be made as early in the fall as possible to allow a sufficient period of good growing conditions for the grass to fill in the voids created by the death of the weeds.

Most lawns contain some young dandelions and chickweed in the fall; in addition we often find ground ivy, buckhorn plantain, hawkweed, clover, and perhaps veronica or henbit. Each of these weeds can be fairly well controlled by a combination of several readily available herbicides. These chemicals are 2,4-D, MCPP and Dicamba. You can find products containing 2,4-D and Dicamba or 2,4-D and MCPP or all three together. The major lawn weed control companies have all these product combinations readily available in your nearby garden center. Dandelion is easily controlled by 2,4-D. Chickweed and clover are controlled by MCPP or Dicamba; ground ivy by a combination of all three chemicals; hawkweed, veronica and henbit by 2,4-D and Dicamba. Choose a combination that best suits your identified weed collection. Get help from your garden center.

Apply the chemicals at the recommended rate as wet spray in a one-to-three-gallon tank-type sprayer. Adjust the nozzle to a coarse spray to reduce drift. High pressure and fine droplets are undesirable because drift to valuable plants is a major concern. Select a day to spray when wind velocity is slight and spot treat each weed in your lawn. Walk slowly back and forth over your lawn in a precise pattern to cover the area thoroughly. Spray only the weedy spots. Don't spray if you cannot see weeds. Repeat this procedure two to five times during the fall as required by your individual weed population. If you have a low population of weeds, spray once in early September, check again in late October; spray only if you can find weeds to spray. If you have a heavy population of weeds, spray every two to three weeks until you obtain good control. Check your turf for chickweed in early November. Very often young chickweed gets started later in the fall.

Some final do's and don'ts. Rinse out your sprayer thoroughly when through spraying. Turn sprayer upside down to drain and prevent rust. Don't use a sprayer that was used for weed control to spray fungicides and insecticides; the

continued

photos by James J. McKeehen



Ground ivy in a home lawn

herbicides are not easily removed and you may kill a desirable plant. Don't spray under trees unless the label indicates it is acceptable. Do read the label. Measure, don't guess, at the amount of herbicide per gallon of water to be used. A few days after each spray application, check to see how you did; within five to seven days most weeds affected will appear so. Don't spray on a windy day – drift. Try to spray far enough before a rain to allow the spray application to dry for at least six to eight hours.

The spring of 1982 should find your lawn free of most broadleaf or viny-type weeds, and your lawn will have become fairly dense and vigorous, if you fertilized and mowed at the right height.

●

James J. McKeehen is the Delaware County Agent for the Cooperative Extension Service, College of Agriculture, Pennsylvania State University.



Buckhorn plantain about 10 days after being sprayed with 2,4-D and Dicamba herbicide

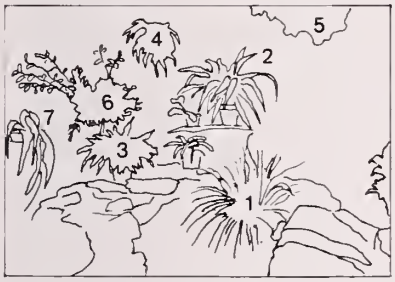
A CALIFORNIA TRANSPLANT SURVIVES FIRST BLEAK EASTERN WINTER

by Gwen Gilens

photos by Edmund B. Gilchrist, Jr



Movement, reflection, and sound are provided by the fish pond. Note three automatic timers, which control the six light fixtures. They are set to be on 16 hours a day. They are staggered to simulate dusk and dawn.



1 *Cyperus lucidus* – spiral palm
2 *Neoreglia spectabilis* – fingernail plant
3 *Nephrolepsis exaltata* 'Bostoniensis' – Boston fern
4 *Platycerium bifurcatum* – common staghorn fern
5 *Begonia* 'Shippy's Garland'
6 *Ficus benjamina* – weeping fig
7 *Ornithogalum caudatum* – false sea onion

"How will I survive the starkness of winter?" That was my first reaction to the prospect of our move from Los Angeles to Philadelphia. I recalled my one winter visit to the East some years ago. My strong and lasting impression was – bleak. Everything seemed brown and bare or grey and slushy white. I had lived all my life in Southern California and was accustomed to 12 months of green. In Philadelphia I wouldn't be able to garden for four or five months.

I began to worry about feeling depressed all winter. With that fear at the back of my mind I went to Phildelphia and dutifully searched for a house for our family. It was summer and I was enthralled with the natural wooded suburbs, so cool and calm in comparison to the planned neighborhoods I was used to in Southern California. For me house hunting was tedious. I approached each house with anticipation and left despondent. One day our realtor said, "I think you'll like this house but even if you don't you must see what they've done with the basement." I went to see it, my interest piqued.

The house was nice and more or less met our needs but the basement – WOW! They had created an indoor garden complete with a fish pond, all under fluorescent lights. Needless to say we bought the house and have since personalized this wonderful garden. It gives us untold hours of pleasure all year long, especially during those "bleak" winter months.

continued



A convenient work area is adjacent to the garden.

converting the basement

The conversion from empty basement to lush garden need not be a difficult job. The creators of this garden first constructed and paneled the side walls. The garden area was then set apart from the rest of the basement. Redwood 2 by 4's were laid out on the floor and screwed into the corners. Here the stone and redwood bark are set on top of the 6 mil black plastic, which covers the entire area, providing some waterproofing. The outside wall was painted brown and since the two end walls are paneled in wood, there is a feeling of warmth, which a more reflective light color would not provide.

The pond area was covered with a one inch layer of fine sand to provide a soft and somewhat insulating surface. It is lined with a very heavy black plastic pool cover, supported and surrounded by three layers of large rock. The rocks, each about 12 x 8 x 3 or 4 inches are fitted together like a dry wall creating a natural free form. The fish pond liner is visible on the bottom and lower sides but we don't feel that it intrudes and it does provide a nice background for the white, gold, and yellow colors of the koi and goldfish. If the plastic was objectionable it could be faced with more stone and the bottom covered with pebbles. However, this would reduce the water volume considerably, the pond containing only about 150 gallons.

We have added a filter pump, eleven small koi, and some aquatic plants. Our success with the plants in the pond has been mixed but we are learning by failure. Only tropical, shallow water or bog plants will succeed. We were unsuccessful with water hyacinths *(Eichhornia azurea),* and our umbrella palm *(Cyperus alternifolius gracilis),* developed extreme webbing which prohibited the umbels from opening. We later learned that this is common with that species. Our most successful plant in the pond has been a spiral palm *(Cyperus lucidus),* a plant similar to the dwarf umbrella palm. We definitely recommend purchasing these plants from an aquatic plant specialist and seeking their advice.

The koi and goldfish seem well adapted to a fluorescent sun. We even have a goldfish that was left when we bought the house three years ago. Fish of this type grow in size according to the size of their confined areas so we really don't have to worry about their getting too large. They are best viewed from above and that is easy because of the way the pond is arranged. Koi and goldfish eat algae and can go without food for relatively long periods so we don't have to worry about them when we go away on vacation. We do hope that they miss us though as they feed out of our hand and we delude ourselves into thinking of this little group of koi as our "friends."

The area surrounding the pond has been covered in drifts of smooth white stones and redwood bark. We have a few stepping stones for solid footing and lots of potted plants. The plants seem as at home in our basement garden as much as we do. We have dug up impatiens and begonias from the summer garden, and they have hardly missed a beat. They rest and bloom and are strong and ready to provide cuttings for the next summer. Much to the surprise of our light gardening friends, our African violets bloom several times a year with up to 25 blooms at a time even



This creative use of a basement provides all year gardening activity.

though they are about 4 ft. from the light source. The dwarf pomegranate *(Punica grandatum* 'Nana') that set its fruit in the summer ripens in the winter basement. The sea onion *(Ornithogalum caudatum)* and the bromeliad *(Billbergia euphemiae)* have bloomed each winter. That is a special bonus.

The garden also provides a haven for the tropical plants from other parts of the house that are in need of rejuvenation. They like the extra humidity and the company of other plants. They are also not so noticeable in their struggling phase when they are in this setting. When they recover we bring them back upstairs.

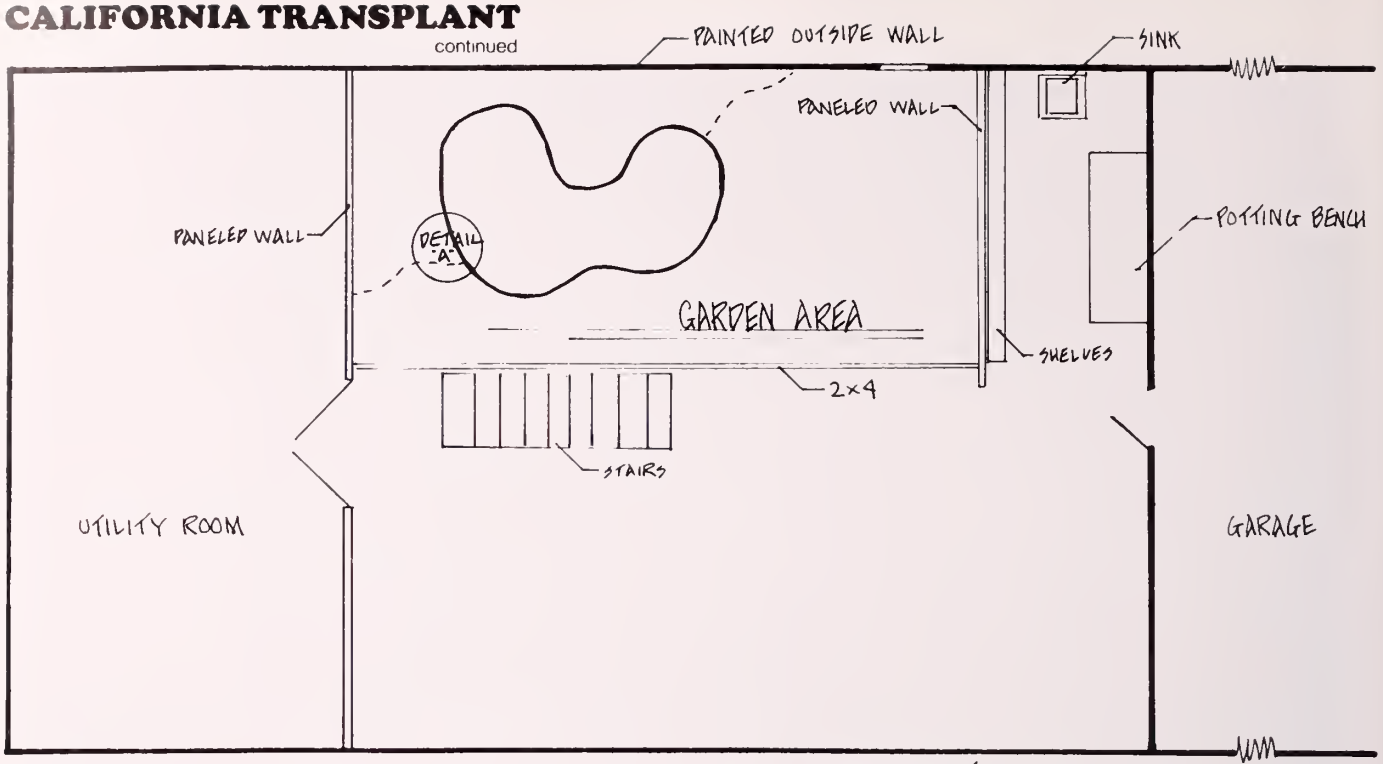
the equipment

Our garden area is 23 ft. by 11 ft. and is lit by six 4-ft. fluorescent fixtures with reflectors hung 7 ft. above floor level. Each fixture holds one warm and one cool white 40 watt bulb. We replace the bulbs every fall when the plants come in from the patio and the garden is rearranged. Fluorescent bulbs diminish their light output and should be replaced after 75% of their rated life for maximum

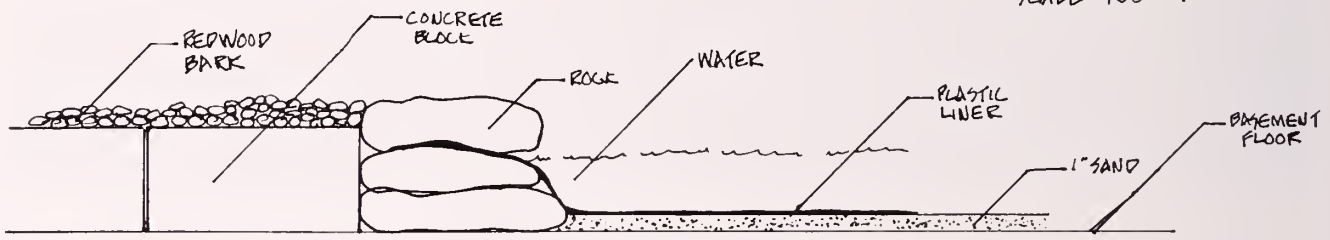
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After accumulating the materials, the pond was constructed in one day.



BASEMENT - PLAN VIEW
SCALE 1/50" = 1'



DETAIL "A" CROSS SECTION
POOL & RAISED AREA

efficiency. From these lights we get 5.6 foot candles at 4 feet and 4 foot candles at floor level. The total cost of electricity is 60 cents a day at the current rate of 7.8 cents per KWH. An admitted luxury in this day and age.

There are many options for a garden of this type. We built up the area behind the pool with concrete blocks and then covered the blocks with redwood bark. This gives us two levels and sets the pond into a "hillside." It is important to provide some elevation changes for a pleasing design. Solid objects give visual weight to the area so we have used two tree trunk sections as plant stands. We also use an old wooden step ladder, some sawed off cedar fence posts and chimney flue pieces to hold plants. The possibilities are endless but must be of materials that are complimentary to and in scale with the garden setting. We've thought of adding a waterfall, a hammock, a deck chair for reading, or an exercycle for winter bike rides. From time to time we set up a table in the garden and invite friends to dine with us. Those who don't know our basement garden are somewhat bewildered when we invite them to a garden party in February.

The forced air heating ducts run through the basement and keep the temperature no lower than 55°F. on winter nights. Because of the pond the humidity ranges between 50 and 75%. We use a 9 in. oscillating fan, which provides continuous air circulation and has so far prevented insect and disease infestation. We do check our plants carefully when we bring them in at the end of summer. We wash them and sometimes spray with insecticide or fungicide.

We were fortunate that the previous owners incorporated the baement sink into a separate garden work center. They used the end wall of the garden to set apart this area. We have our potting bench, which is an old redwood picnic table with the benches nailed on top for shelf space, and all our garden supplies there, close, but out of sight. Another advantage we have is that the garage is adjacent to the basement so we can enjoy our fish and our garden as we come and go.

I am happy to report that "winter bleakness" has not been a problem; we can prune and weed and putter all year long in a lovely garden setting. Our adjustment to the East has been a happy one and we are grateful for the help of this bit of green in our lives.

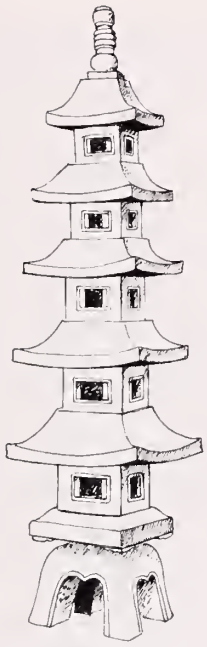
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Gwen Gilens owned and operated her own interior landscape business for four years in Los Angeles. She was known as "The Plant Doctor – Makes House Calls." She is a May 1981 graduate in Landscape Design from the Ambler Campus of Temple University.

SOURCES FOR AQUATIC PLANTS

Lilypons Water Gardens
Lilypons, MD 21717
Phone: (301) 874-5133
charge for catalog $1.50

William Tricker, Inc.
74 Allendale Avenue
Saddle River, NJ 07458
Phone: (201) 327-0721
no charge for catalog



Breezewood: A Japanese Garden

by Amalie Ascher

It sparkles like a jewel, its facets and intricacies inspiring contemplation and wonder. Though of the here and now, the garden recalls centuries past and worlds remote. Ever evolving, it seeks the ultimate in taste and design.

Breezewood is an estate owned by Alexander B. Griswold who, as president of the Breezewood Foundation, has made of it a mecca for the study and display of Asian history and art. Far from the city in the rolling hills of the Maryland countryside, the property is situated in an area called Monkton or My Lady's Manor, renowned for the hunt. But the drawing power of Griswold's establishment, which at certain times is open to the public, derives as much from its Japanese landscape as it does from its collection of Siamese Buddhas and related relics. And though the setting has developed in stages, whether by professional direction or through Griswold's own initiative, the sum total reflects his goals and lifestyle.

From the beginning, the garden was destined a showplace. Its original owner was Edna Parlett, a devotee of fox hunting. She bought the place in 1925 to pursue the sport. Her sister, Mary Parlett, owned a home nearer town, and the two women alternated their time between the two residences, spending spring and fall in Monkton and winters on Bellona Avenue. In summer, they moved to their home on Cape Cod.

Edna Parlett was keenly interested in gardening. She had studied English and French landscape architecture abroad and not surprisingly arranged for a European garden at the north side of the house. The design featured a large lawn and radiating hedges of *Taxus canadensis* or American yew. She also had a large cutting garden tended by six gardeners, who looked after the rest of the grounds as well. The entire place was said to be beautifully maintained.

Griswold, a bachelor, bought the estate in 1946 following Edna Parlett's death at the time of World War II. Though he eventually did away with the cutting garden, finding it more than he could manage, he retained the European garden ornamenting it with Italian stone statues of the Four Seasons. The group includes Neptune, symbolizing the abundance of the sea; Pomona, who symbolizes the bounty of the land; the goddess Diana; and Actaeon who, Griswold explains, was a human unfortunate enough to fall in love with Diana. Annoyed by his attentions, she turned him into an animal. His hounds, mistaking him for a stag, killed him.

Restyling a plant compares to changing your hair-do. Shinomoto forces trees and shrubs to grow in ways nature never intended.

To plan his garden, Griswold engaged Ethelbert Furlong, a landscape architect from Northern New Jersey, who had designed the Japanese garden at the Museum of Modern Art in Manhattan, and who had made an extensive study of the subject. The first of several phases was begun in 1955, and though Griswold now admits he didn't know then the exact form his garden would take, he had decided that it would follow Japanese principles though plants need not necessarily be restricted to native Japanese flora.

The garden began taking shape at about the time the museum wing adjoining Breezewood was being constructed. Planting was needed to conceal it and to create an entryway to the garden. Thus a grove of pine trees took root at the southwest corner of the house. The grouping consisted of red, white, Scotch and scrub pines, and the winding path between them was spread with pine needles.

Griswold's interest in Southeast Asian art began directly following World War II during the time he was stationed in Bangkok awaiting transfer home and discharge from the Armed Forces. To mark time, he visited museums, found the art to his liking, and significantly, realized he knew little about it. Seeking to explore the matter further, he resolved to return to Bangkok for more extensive study and to visit additional museums, monasteries and private collections. His first trip, six months after becoming a civilian, set a pattern that was to continue for 20 years during which he divided his time equally between home and Bangkok. Griswold collected Siamese art between 1948 and 1951, forming one of the most comprehensive collections of Siamese Buddha images in the United States.

Following the installation of the pine tree grove, an assemblage of 20 large stones was added near it, their fantastic shapes providing an arresting focus at the corner of the museum wing. The stones had been obtained by Furlong from a large rocky formation in the area where he lived. "He and I agreed they fit

continued

in very well with the Japanese garden design," Griswold said, "and they harmonized with the oval window at the west end of the museum." Subsequently, more boulders appeared at strategic points near the pools, most of them native to Maryland. Some are granite, others white quartzite. Native slate has also been used. The stones reappear throughout the garden.

Overall, the property covers 70 acres, five of which have been turned into the Japanese garden. The remaining area is taken over by woods, farmland and a sizable vegetable garden (see *Green Scene,* July 1981).

ponds

One large pond was in place when Griswold acquired Breezewood, so named by Edna Parlett. But since ponds are typical of Japanese gardens, Griswold wanted others. One by one they sprang up, some connected by a stream forming a waterfall between them, but all irregular and artistic in shape. "Mr. Furlong did a lot of planting around the first two ponds," Griswold said, "adding a blue Atlas cedar *(Cedrus atlantica)* and native Japanese plants to the existing black locusts."

Among the garden statuary collected by Griswold to decorate the garden are Japanese bronze and stone lanterns, a small stone pagoda, and several Chinese stone figures including a scholar and his wife. They complement the even more striking pagoda and gazebo that are salient features of the garden. Both were converted from former uses. One had been a pigeon house (Edna Parlett was fond of squabs), whose lines suitably adapted to Southern Chinese style. Furlong redesigned the octagonal superstructure, which was made of stone, removed the slate roof, added a second story and topped it with a pagoda roof. The wood trim and pillars are painted Chinese red in the typical Chinese manner. Similar alterations were made to the other building, which was and still is a tool house, to give it a Mongolian or Northern Chinese appearance.

In planning the planting arrangement, Furlong took care not to mix colors, which for the most part emphasize white and red. In all-green areas, he blended textures, leaf shapes and growth patterns. Trees and shrubs include rhododendrons and azaleas, a Chinese dragon-eyed pine, *Cotoneaster horizontalis,* osmanthus, cherry laurel, bird's nest spruce, Chinese miniature boxwood or pin cushion box, *Mahonia aquifolium* and *M. bealei,* Korean box, an unusual variety of honeysuckle, *Ilex crenata,* sarcococca, Alberta spruce, red pine and a weeping white pine leaning over the waterfall.

To symbolize a natural scene, some shrubs, especially those growing near the ponds, have been clipped into low, rounded forms to suggest rock formations or mountains. On an artificial ridge west of one pond, a group of American boxwood has been shaped to represent a distant mountain range or hilly terrain. The garden itself, Griswold says, recreates a landscape in miniature. Small-scale mountains and lakes, he explains, use space more efficiently and project the illusion of largeness. In a Japanese garden, appearances change at every turn, luring the spectator in and around to observe the view from every angle.



photos by Duane Suter

The ponds of irregular shape incorporate native stones and Japanese ornaments, as well as a small stone pagoda. House in the background shows projection of museum wing designated by oval window.



The most recent addition to the garden is this large pond designed and constructed by Yoshi Shinomoto. He changed the contour from a straight-sided edge by relocating soil to create coves and promontories.

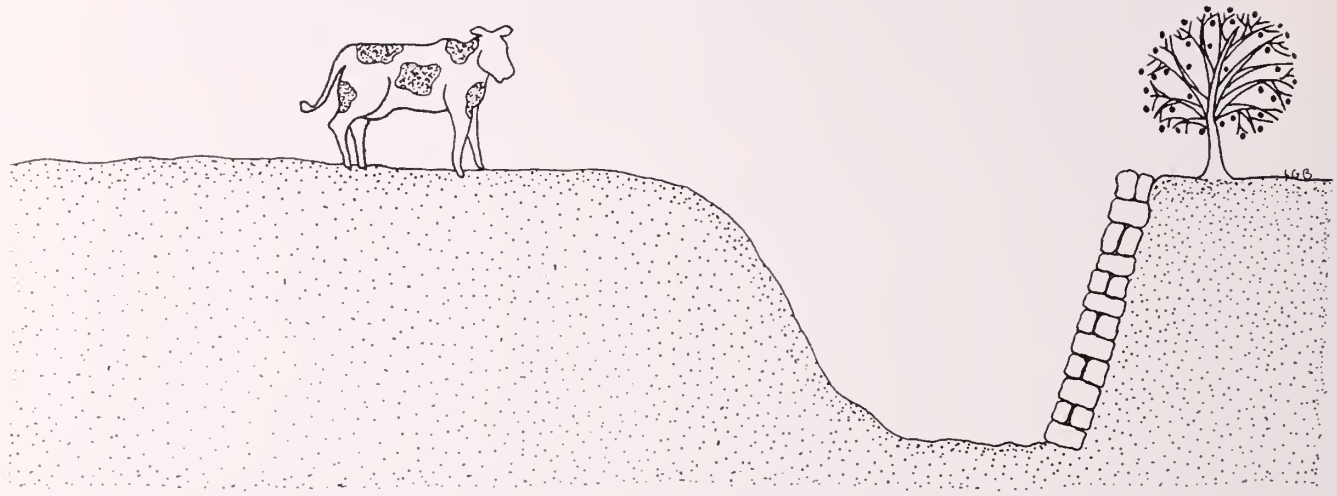
A Japanese garden may combine many kinds of gardens, and Griswold's offers a variety. Near the house lies a stone and gravel garden of the type maintained by monks to stimulate the mind. The gravel represents the sea, large stones, mountains or islands, which in Japan are surrounded by moss to suggest a forest around the shore. But since conditions at Breezewood are unsuited to growing moss, Griswold substituted sedum instead. A walking garden permits viewing plants at close range.

spring garden

In the spring garden, wildflowers predominate, though in addition to trillium, star of Bethlehem, snowdrops, dogtooth violet and azaleas, lily-of-the-valley can also be seen. Here and there, too, unusual plants can be noted, among them franklinia, halesia, double-flowering dogwood, lace bark pine, Cedar-of-Lebanon, deodar cedar, and katsura. The leaves of the katsura, like those of the aspen, quiver when the wind blows.

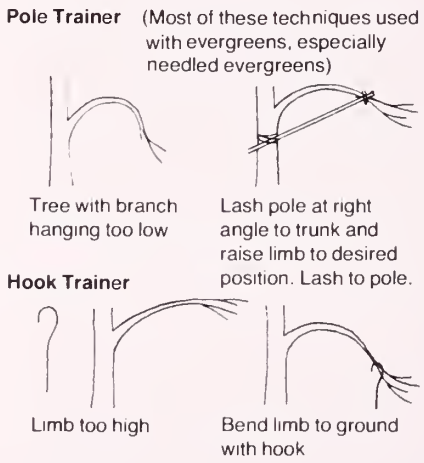
Design-minded gardeners and horticulturists will be in their element in Griswold's garden when seeing the fascinating methods devised for shaping trees and shrubs into artful forms. Many of the practices have been of Griswold's making, but they have been developed to even greater heights by Yoshie Shinomoto, who joined Griswold's staff 11

continued



Haha wall

years ago as horticulturist and resident caretaker. Restyling a plant, Shinomoto says, compares to changing your hair-do. He forces trees and shrubs to grow in ways nature never intended. A 30-year old American dogwood, 20 ft. tall became a mound by cutting it back to 2 ft. and removing suckers. A red pine was clipped to express movement as though swirled by the wind. In restructuring a spreading blue Atlas cedar, Shinomoto inserted a 7-ft. high bamboo pole in the ground beside the trunk and propped it under one of the main branches to raise it. To bend a branch, he ties a rope to it and weights it with a brick or stone, pulling it down by increasing the weight gradually over a period of months. (A



branch 5 in. in diameter is the maximum size accepting this treatment.) To alter growth habit, he says, you can also lash a pole at right angles to the trunk and bend the leader to it. (See illus.) Or, to change the direction of branches, tie a rope between them and tighten it little by little over a one- or two-year period. "It's easier," he says, citing logic, "to train a tree while it's young." To convert a tree to a bonsai, Shinomoto cuts it short, removing all but the lower twisted branches, then prunes them to reveal the best lines. Another training device is fashioned from heavy wire, one end bent in a hook, which catches a branch. The long end of the hook, sunk in the ground, pins the branch down. (See illustrations.)

Shinomoto has even trained into ground covers upright plants such as 15-year-old English holly normally 20 to 30 ft. high and a crab apple now 20 years old, but started when it was very young. To train the hollies, he bent stems as they grew, pinning new growth to the ground and cutting off non-conforming shoots.

haha wall

If you have never encountered a haha wall, you'll find one at Breezewood. Of 18th century design, this retaining wall separates lawn from pasture, Griswold says. The construction is tricky, since the level of the pasture must lie 4 ft. lower than the lawn. The top of the wall is level with the lawn, the bottom with the pasture and 4 ft. below the level of the lawn.(See illus.) Haha walls are made of brick or stone and so-called, Griswold says, because they fool you. Wondering how cows and horses close-by in a pasture are kept from a lawn, a visitor peers over the edge of the wall and exclaims, "Haha, *now* I see." These walls came into use in England in the 18th century.

Other walls in the garden create architectural interest too. A serpentine brick wall imitates one designed by Thomas Jefferson at the University of Virginia. Its curvilinear construction makes it economical by reducing thickness to the width of a single brick. In other areas, worm or snake fences made of chestnut rails and taking a zig-zag pattern derive their support from their shape, which requires light poles to bolster them rather than heavy ones.

The most recent phase of the garden (one hesitates to call it final; who knows when inspiration will strike and development begin anew) was begun eight years ago by Shinomoto, who designed and almost single-handedly constructed it. Most extraordinary is the large pond approximately 30 ft. wide by 140 ft. long by 3-5 ft. deep, which forms the centerpiece. Shinomoto carved it out of the ground and to change the contour from a straight-sided edge, relocated the soil to make coves and promontories. He also brought in boulders weighing 5 to 10 tons from the adjoining properties of Griswold's brother and sister, installed steps and a slate waterfall, and added a great many trees and shrubs.

"A garden never comes to a standstill," Shinomoto philsophizes. "In growing or dying, through pruning or maintenance, plants change the face of a landscape. It never reaches a stage when it is complete. There are always improvements to be made."

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Amalie Ascher is a frequent *Green Scene* contributor.

Breezewood is open to the public on the first Sunday of the month May through October from 2 to 6 pm. Admission is $2. Groups wishing to see the garden only by appointment may call 301-472-9438.

Use Angled Sunlight for Dramatic Flower Pictures

by Barbara Bruno

The low angled sun of morning or evening sets off garden plants and provides rich shadows that almost insure spectacular photographs of flowers. Often, photos differing widely in feeling, although equally pleasing, can be produced by shooting the same scene in the golden rays of early morning, then again in the warm light cast as the sun sinks low in the western sky. These harshly oblique rays oflight emphasize both texture and shape and can be used to delineate interesting features when used as back, rim or side lighting.

Thinly textured blooms, as well as plants that produce an abundance of tiny flowers, become glowing snatches of electrical brilliance when ignited from behind by the sun's prodding, horizontal beams. This characteristic intensification of color through backlighting can be used to create frames filled with vivid, luminous foliage that surpass the appeal of many conventionally lit flower pictures. Sunshine filtering through delicately veined growth really lifts photos of colored-leaved plants out of the category of the ordinary, and tender green new growth displays an alluring vulnerability when captured at this angle.

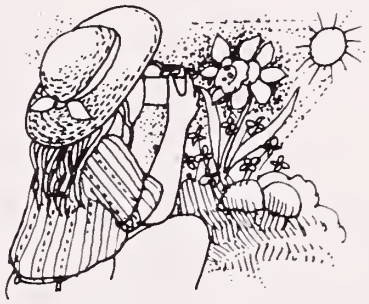
Rim lighting enhances photographs of plants that have interesting silhouettes. The awesome outline of thorn armored stems can be emphasized by an elegantly penciled, phosphorescent edging. Hairy branches become a golden aura surrounding delicate plant parts, and vague networks of wiry stems are transformed into golden filigree supporting incandescent blooms.

Plants witha large, solid structure, whether it is in blossoms, flower spikes or sculptural leaves, take on architectural importance when side lit to show their three dimensions. Silver-leaved plants are top-notch candidates for this treatment. Their felted surfaces catch microscopic dots of light causing the folige to gleam with a ghostly presence.

If you are a contemplative photographer who likes to take ample time planning each frame before shooting, working fast enough to catch all of the possibilities presented by constantly changing light conditions can be a challenge. Weather uncertainties and ephemeral quality of flowers reduce the odds that conditions will be exactly the same on the subsequent night. In the race with time, shifting tonalities and quickly lengthening shadows, good shots may be lost even in the short interval that changing film demands.

Most of my flower photographs are taken in my own garden. I am interested in recording the effects of atmosphere and the changing seasons unique to my horticultural surroundings. I try to capture the unexpected incidents of light and growth that daily astonish me with

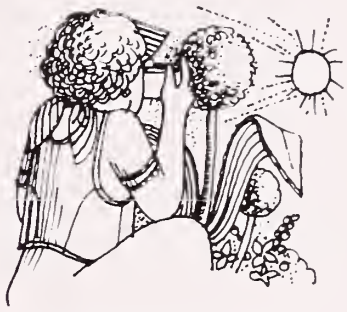
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USE BACKLIGHTING TO ILLUMINATE A SUBJECT FROM WITHIN.



USE RIMLIGHTING TO DRAMATIZE THE OUTLINE OF A SUBJECT



USE SIDELIGHTING TO ACCENTUATE BOLD, ARCHETECTURAL FEATURES

drawings by Barbara Bruno



photos by Barbara Bruno

Sunlight sometimes produces dramatic spotlight effects. In this shot, rays of a setting sun create an aura of golden light as they catch in the spires of hairy seed pods of *Perilla frutescens* 'Atropurpurea,' while highlighting a clump of flat-headed flowers of *Sedum spectabile* in a rich flow of molten red. Exposing for the bright spots increased the drama of the setting.



Sidelighting: The sculpted undulations of common yarrow, *Achillea millefolium,* are captured in the contrast, brilliance and shadow of sidelighting.



Rimlighting: Evening illumination forms as aura around the spikes of *Stachys officinalis,* defining the seed capsules with a rim of golden light.

their will-of-the-wisp charm. For wildflower photos I practice the same strategy, making it a habit to mentally picture what morning and evening light might do to a particular scene. If interesting effects seem possible I try to return to check them out.

I used a 20-year-old Yashica LM twin lens reflex camera to take the photos pictured here. I consider a tripod essential. My equipment also includes a Nikon FM SLR, used when the scope that the SLR (single lens reflex) system provides is needed. It is also an easily portable field camera, but I prefer working with the square format of 120 mm film. (Generally I use Kodak's Ektachrome 64.) Whatever photographic equipment you possess, you will be pleasantly surprised at the dramatic life that angled sunlight can add to your flower pictures.

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Barbara Bruno is a frequent contributor to *Green Scene.*



Backlighting: Backlighting intensifies the already potent color of daylily blooms to a glowing bravura of reds and golds.

Shipley Sprouts Blossom

by Leila P. Cleaves

By mid-morning the classroom was a mess. On long tables covered with shower curtains, cement-like masses were taking on different shapes. Gloved students were busily slapping a mud-pie like batter over forms. With the mixture all over the floor, the tables, and the students, and with the combination of beaver-like industry and laughter, it really looked more like a kindergarten class than one phase of the horticulture mini-term at Shipley School.

Back in the spring of '74 a friend and I planned an activity period in the newly erected school greenhouse. From some simple 45 minute sessions on seed propagation, a host of horticultural activities developed. These eventually culminated in the three-week spring mini-term in which juniors and seniors, ages 16-18, can specialize in a field not covered in their normal academic curriculum. Six students chose the horticulture mini-term this past year, and two others were involved in independent horticultural projects. Of the two independents, one, Therese Ross, chose to work for a landscape architect, and Emily Gazitua took on the task of identifying three plant families in an arboretum near her home in Santo Domingo.

developing creativity

The results of the messy activity in the classroom were trough containers. Although they were made primarily to plant and enter in the Philadelphia Flower Show, there were other reasons for making them. They were inexpensive to make and the ingredients are readily available. They can be easily made at home and make wonderful gifts. The students can also plant them to brighten up the school. The main reason, however, is that it gives the students a chance to develop their creativity. When making a rock garden style container, Tina had to work the design out upside down and backwards. With her diagram on the blackboard she made a mold with sand, only to find that her pots, which later would be her planting pockets, sank into the sand. By stacking a number of pots on top of each other, Tina solved that problem.

Caroline, who was entering her first Show, won three blues as well as the Herb Society Award (on Friday) for her long thin trough filled with herbs. The prize has inspired her to grow herbs and specialize in the mint family.

Caroline also tackled a new shape – a long thin container. With five pots placed upside down and taped to the plastic table cover, she hoped the tape wouldn't loosen when she added the wet mixture. Would the scalloped lip be noticeable with this coarse textured mixture? Had she gotten the sides the same thickness? To find out she took a knife, stuck it into the mixture until it touched the pots, and continued doing this all the way around. No one would really know what her creation looked like for 48 hours until the troughs were firm enough to flip over. We were all worried, however, when two troughs stayed cemented to the boards they were sitting on. After much chiseling they were pried loose without much damage, to their creator's great relief.

Because the mini-term happens to straddle the week of the Flower Show, the main emphasis is on getting ready for and participating in this exciting event. The flurry of activity just begins

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The Students

Most of these students liked gardening before joining the mini-term (program) but only had a rudimentary knowledge of horticulture.

Emily Gazitua's interest in plants began at home where she lives in the tropical rain belt of the Dominican Republic, where trees and plants grow faster than you can prune them. She has enjoyed helping her Dad keep their jungle garden under control. Emily, also a helper in the greenhouse, worked for a landscape designer last year. This fall she hopes to work in the Haverford College Arboretum. Her experience in Sprouts in last year's mini-term led to an independent project classifying plants. This past summer she continued her project and studied the orchid family.

Caroline Burkhart's early exposure to horticulture was deeper and more varied than the the other students, but it also began at home. She lives on a 90-acre farm where she helps her Dad care for a sizeable orchard, two vegetable gardens, flower beds, a large lawn, and a greenhouse. It is not unusual for her to be up at dawn spraying fruit trees. During summers she uses these talents to maintain her neighbor's gardens and lawns. She has thoughts of studying botany at Princeton. While only at Shipley one year, her bulb forcing, propagation, and flower showing skills have developed to a high degree.

While **Tina Rovito's** father, the gardener of the family, was alive, Tina didn't do any gardening. It wasn't until she was 13 when she found some seeds for 12¢ a package at the Philadelphia Flower Show that she started growing plants. She has been a regular worker in the Shipley greenhouse for four years. In fact last year she grew at least three-fourths of the plants and did most of the work. She has worked for the last two years at Garden Fair, is a volunteer at the Tyler Arboretum, and a few months ago was a finalist for the 1981 P.H.S. Junior Horticulturist Award. She plans to major in horticulture at the University of Delaware. Her active interest in plants began four years ago when she took part in the horticulture activity period which, by this time, had acquired the name "Shipley Sprouts." Then, two years later, she became a strong force in the mini-term program.

The Author

Leila Cleaves exhibits in the Philadelphia Flower Show, and is involved at Bowman's Hill Wildflower Preserve. She graduated from Barnes in 1974. She runs the horticulture activity program "Sprouts" and the horticulture mini-term at Shipley School.

During Mini-Term

photos by Leila Cleaves



Emily Gazitua and author working on trough. Form is half a watermelon.



Caroline Burkhart works on an ivy topiary.



Tina Rovito works in the greenhouse on her ivy topiary. The topiary made it into the Show.



Tina Rovito's 1980 trough container filled with herbs. (Received honorable mention.)

Caroline Burkhart's trough container – received honorable mention in 1981 Show. It won Herb Society Merit Award for the day.



with the making of the troughs. It is quite a bewildering experience to rummage through some 60 houses at a wholesale nursery trying to find the right plants for 18 different containers. Luckily, Tina knew what plants she wanted and also knew her way around from last year.

at the show

The students found that being involved in the Flower Show was a tremendous learning experience. There were parts they didn't like, such as leaving school at 6:30 am to get their entries into the Show on time. A few of them were frustrated by the confusion of entering the Show for the first time. They worked hard. Some students had one day to plant their troughs or terrariums. The days before each entry day were busily spent grooming dish gardens, terrariums, and many bulbs. After the last of these grooming sessions Marie Elena wrote in her log, "Watch out, Show. Here we come!" Little did she know then that out of 94 entries, the sprouts would garner a total of 36 ribbons – seven of them blues. Caroline, who was entering her first show, won three blues as well as the Herb Society Award (on Friday) for her long thin trough filled with herbs. That prize has inspired her to grow herbs and specialize in the mint family. Because of their industriousness the students were able to appreciate even more the quality of the other exhibits as well as the dedication of many horticulturists. When they happened upon two blue ribbon exhibits at Weldon Nursery the week after the Show, they were impressed with the amount of work and skill that went into the exhibits.

Another phase of the mini-term involved trips to various arboretums and gardens. The trips were scheduled throughout the three weeks and exposed the students to new ideas, settings, and plants. At Longwood Marie Elena and Anabel delighted us with their knowledge of many tropical plants and especially their favorite fruits. They were fascinated by the different "climas" (climates) in each house and how each affected the plants that grew there. They noticed other details that they incorporated into their terrarium, a first for both of them. They created a 3-D effect by mounding soil in the back of the terrarium and used sticks placed horizontally as a retaining wall. To add a realistic touch, a little piece of moss was tucked into the wall, a detail they had seen at Longwood.

A third phase included a project on propagation techniques. At Winterthur we toured the greenhouses and were given some hints by John Feliciani on propagating azaleas. We were given a plant to experiment with, and Caroline succeeded in rooting seven cuttings taken in early April. Two other students wrote papers on the propagation of succulents and gleaned most of their material from the Cactus and Succulent Society's exhibit at the Show. Throughout the three weeks each student kept a daily log for future reference, and wrote weekly papers. Although it wasn't easy for some of the students to give an oral presentation on the last day of mini-term, it did give them a chance to share experiences with other Science Department students.

After starting out with the messy classroom, we ended up three weeks later with a greenhouse full of cuttings and many new troughs and dish gardens. We made new friendships, cultivated old ones, and shared knowledge. The Flower Show served as a focal point for the mini-term. The "Shipley Sprouts" certainly blossomed this year during the mini-term.

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ACCOMMODATING PLANTS FOR THE INDOOR GARDEN

by Ruby Weinberg



photo by Pamela Harper

Cyclamen – florist's miniature

I have collected subtropical plants for winter container gardens on and off for about 25 years, and the fascination never fades. Occasional trips to warm places abroad, or to our own Deep South, have been enhanced by observation of the subtropical flora. Inspiring, also, are the many botanical books with renderings of species from every corner of the world. When I see these plants and the renderings I wonder will this herb or vine, small tree or shrub, grow as a potted plant? Will it do well in my greenhouse or in a sunny window? Will it look especially nice in mid-winter?

At present, rare plant nurseries and seed houses seem to be offering a wider selecton. Their catalogs represent treasures from such places as Australia, India, Madagascar, New Guinea, and South Africa, to name a few. To the dedicated indoor gardener, it is tantalizing.

If you like unusual plants, but you are short on time, or money, or proper environment, then search out accommodating plants. Many can be grown inexpensively from seed. Even if you must relegate their placement to an only slightly heated room, it is surprising how many species do well. Some endure radical, though temporary, changes in the temperature that sometimes occur in the home or office. I have never found a plant that thrives on neglect, but quite a few will adjust to a situation that I call "erratica": capricious cultural conditions.

Growing subtropicals in the colder parts of the United States is becoming quite a challenge. Commercial growers are having a difficult time adjusting price to cover the soaring cost of heating fuel. In our homes, the area with the largest amount of glass is likely to be the best place to grow exotic plants. But glass structures, greenhouses included, are probably the most expensive to heat.

My greenhouse, located on the northeast fringes of the Delaware Valley, is south facing, and receives almost a full day of sunlight. I have tried to "play it cool" with winter heating by tampering with the thermostat. "Erratica" is not favorable to best plant growth, but it is interesting to observe the results of an altering environment. And it is cause for optimisim to learn that there are many genera and species that perform well in spite of inconstant conditions.

Sun bathed during the day, my greenhouse requires little oil to maintain a 65° night temperature during October and April. In November and March, it is heated to 60°, and in December, January, and February, 50°. As winter deepens and days shorten, many plants suffer more "leaf go" than "leaf grow." But not all. Some of the tender subtropicals become dormant. But by the end of February, recuperation is on the way. At the end of March, sturdy growth resumes once more.

Under such conditions, I cannot grow just any old plant. It's too cold for most gesneriads except for *Aeschynanthus lobbianus,* the lipstick vine. Then, too, the gorgeous Rieger begonias and the New Guinea hybrid impatiens are not for here. Exasperating, also, is that camellias would sulk in spring and fall from too much heat, and other cool crops, such as primulas, really need to be placed in a cold frame by mid-March.

hardiness factors

Hardiness in ornamental plants includes a number of factors. Of these, minimum temperature causes the most immediate stress. Several years ago, many growers of rare exotics in South Florida, not prepared with supplementary heat, lost almost all of their stock when an abnormal freeze occurred. Homeowners, as well, lost some of their tender ornamentals. But, taking in the total picture, the landscape afterwards was still lush and beautiful. Edwin Menninger, in his book on flowering trees for warm climates, lists 63 subtropical trees

continued

that survived temperatures as low as 25° and 84 that survived 20°. A host of herbs, vines, and small shrubs from warm climates will outlive low temperatures, though possibly not as drastic as just stated for trees. If erratic conditions sometimes exist in your indoor garden, no need to eliminate exotics. Try to grow *likely* possibilities and see for yourself how they adapt to the conditions that you can provide. In a less than perfect locale, there are many accommodating plants well worth discovering.

A good part of the eastern U.S. experienced a bitter cold winter, 1980-81. Then, if ever, my subtropicals were severely tested. Although the greenhouse has an alarm system, it went undetected for several hours when the temperature fell to 40° F under glass, and was headed lower. A frozen heating pipe was the culprit. Luckily, my husband was able to quickly defrost the pipe. No damage affected the plants.

But in mid-January, a minor catastrophe of another sort developed. The temperature, on two consecutive nights, plummeted outdoors to a record of 16° below zero. The greenhouse remained a constant 50°. In the morning, I discovered that suddenly, our deep and faithful well had given up the ghost. No water in the house. The greenhouse heated with hot water also began to cool down. Emergency kerosene heaters were on hand to take care of that problem. It was eventually recognized that the pipe leading to our underground pump and well was partially frozen. It took four days to diagnose and defrost, during which time the plants were very dry. Numbering in the hundreds they are usually watered with a hose. Now, we used bottled water poured from a watering can. Growing in the sun, species of Crassula, Kalanchoe, Pelargonium, Punica, Ruellia, and Senecio, were not watered at all for eight days. These accommodating plants suffered not at all and received my everlasting admiration. Indoor gardeners who travel a bit and must leave their plants now and then under the care of a less knowledgeable substitute, might well appreciate these troupers.

Some genera are, of course, excessively fussy about one thing or another. Others take "erratica" in good stride. When you think of *Magnolia grandiflora,* indigenous to the hot swamps of Mississippi, flourishing in colder, drier places as far north as Philadelphia, then you know that some plants are really adaptable. Many subtropicals are popular house plants because of their ability to cope with a variety of situations. *Asparagus sprengeri* grows weed-like in South Florida, where it's often used as a ground cover in full sun. Yet, in the northern home, it can endure winter temperatures down to 50° and the lower light levels of an east or west exposure.

The sophisticated gardener may want to grow plants that are lesser known species and/or some of the lovely new hybrids now on the market. He makes an effort to learn about individual plant needs, and before attempting to cultivate them, considers rate of growth and plant size so that the species in question will fit into the allotted space at maturity. But in dealing with flowering plants, especially, his major consideration is a good source of light.

In our climate, during the shortest days, my experience has taught me that there is no such thing as too much sunlight. Even shade lovers such as begonias benefit from plenty of sunlight during December, January, and February. Fluorescent lighting is a good substitute, but practical only for the initial stages of growth, or for growing small plants. Four or five hours of unrestricted sun grows a wide variety of exotics. As the days lengthen, more shade is usually needed. With only a few exceptions, I summer as many of my greenhouse plants as I can handle on a shady patio. Returned indoors in mid-September, light shade is needed until the end of autumn, especially if the days are bright and cloudless.

photos by Ruby Weinberg



Potted plants spending the summer on a partially shaded patio

not always easy to grow

People sometimes ask me: "What are your favorite plants? Which are the easiest to grow?" – all in the same breath. A favorite is not necessarily the easiest to grow, but accommodating specimens earn my respect and admiration.

Both the cane (angel-wing) and rhizomatous begonias fit into this category. Most that I have tried perform beautifully in mid-winter. If the beef-steak begonia *(B. erythrophylla)* is popular, there is justification, for this is a plant that can always be counted upon for a large number of long-stemmed pink flowers by the end of January. If you want something more unusual as a variation of this plant, try *B.* 'Bunchi' with ruffled leaves or *B. helix,* with spiral leaves. There are hundreds of winter blooming cane types as well. Two that I especially enjoy are

B. 'Di-erna' and *B. foliosa.*

The crassula family is huge and contains many types. One of my favorites is *C. cooperi,* a mat forming species with tiny leaves in rosette formation. It remains a long time in a 4 in. pot, the pressed leaves spilling over the top and clinging to the sides. In mid-winter, it sports multitudinous small white flowers.

New miniature cyclamen will take more heat than the older *Cyclamen persicum* hybrids that withered in a



Senecio rowleyanus

house warmer than 55°. Miniatures, such as the new dwarf 'Bambini,' are accommodating to highs and lows. They're easy to grow from seed to maturity and come into bloom quicker than older types. They take up little space and can be flowered and grown in 4 in. pots.

Kalanchoe is a genus of considerable variety. The new patented cultivars such as 'Adagio,' 'Firefly,' and 'Yellow Nugget' prefer 65°, but can be grown cooler. To bloom for Christmas, artificial light must be excluded from them 14 hours every night from September 10 to October 15. Sometimes, I'm obstinate and go ahead and light the greenhouse on autumn evenings. But by mid-January to early February, the blooms appear all the same.

If you want to grow kalanchoe from seed, the Swiss hybrids are pretty and 'Yellow Tom Thumb' is no taller than 8 in. with tiny leaves and pale yellow flowers.

Species kalanchoe are of extraordinary interest and those that I have grown are winter blooming. *K. manginii* is a wiry trailer with small leaves and many curious bell-shaped orange flowers. *B. pumila* has scalloped leaves and clusters of purplish-pink flowers.

Many kalanchoes have brittle stems. If a budded or flowering stem should break off inadvertently, take it as no loss. Remove the leaves on the bottom of a 3-in. stem and reroot in damp perlite It is amazing how the inflorescence is unaffected by this trauma, and the cutting will provide you, immediately, with a small flowering plant.

As winter deepens and days shorten, many plants suffer more "leaf go" than "leaf grow."

There are legions of pelargoniums, or geraniums, that tolerate winter highs and lows indoors. In fact, the fleshy rooted types save themselves for winter bloom and become dormant in the summer. From *P. hortorum,* the garden geranium, have come some splendid dwarfs about 9 in. tall. A mature plant is not nearly as woody as a held-over garden geranium, and develops into a fat, bushy specimen. By its second year, the plant parades at least a few colorful blooms in mid-winter. Temperatures below 50° will destroy the buds and flowers but not the plants.

Unfortunately for me, many other subtropicals that I must try eventually become far too enormous. My small greenhouse cannot hold more than a few – at a time – 8, 10, 12 in. containers. The discovery of giants that *will* stay manageable is part of the fun. If you have sun try calliandra, oxora, jasminum, and tecomaria, to name a few. In a more spacious sunroom, you can try cassia, dombeya, tibouchina, and passiflora. I've tried species of these and other plants, and have unnumbered genera to yet discover. Luckily for my plants, if a flourishing specimen should behave as though it were in the middle of the jungle, I can plant it in the open ground – in Florida.

a mixed bag

The following list of ten is a mixed bag of subtropicals that flowered or fruited for me undisturbed during the winter of 1980-81:

1. *Anthurium scherzeranum,* from Costa Rica, the flame plant. This species, particularly, takes cool winter temperatures. The spathe, or outer bract, is blood red, and the slender spadix, or flowering spike, usually yellow. Mine, a slight variation, is red also. Its interesting feature is this spike, which curls upward like a little sweep of smoke. A slow grower, but everblooming.

2. *Begonia* 'Richmondensis,' a cane begonia, also blooms on and off all year. Its lax stems cascade heavily over the pot. Leaves, about 2 in., are dark green with burgundy undersides and have a beatiful sheen. The male flowers are white with pink bracts.

3. *Crassula multicava,* from S. Africa. I brought it home as a cutting from a plant in Italy. Its opposite, leathery 2 in. leaves join together at the stem, and the flowering stems, a foot in length, are terminated with clusters of tiny flowers, white with a lilac stripe on each petal, creating a charming, dainty picture. The plant remains a long time in a 5 in. pot. Mine cascades several feet.

4. *Ficus diversifolia,* from India and Malaya, grows slowly to about 3 ft. My mistletoe fig, several years old, is only one foot tall. It might be called a foliage plant, for its flowers are insignificant, but its obovate leaves are attractive. Yet, its delightful feature is the little figs, shaped something like an acorn. The flat end of the figs is a bright yellow, and there is a slightly yellow suffusion in the fruit. It can be grown from cuttings, possibly from seed.

5. *Fortunella margarita,* from China, is the Naggami kumquat. My three-year-old grafted plant is still in its original 10 in. container. This citrus related plant can be grown from seed or cuttings also. Outdoors, in the summer, fragrant orange blossoms appear in two or three stages. They are pollinated profusely by insects. The fruit turns bright orange by Christmas, and then is ready to be har-

continued



Asparagus ferns, begonias, and impatiens grouped in west window.

vested. A second crop matures a month later. If you want a dwarf tree-shaped plant, prune it in the spring to allow a bare trunk a foot or more high. The top grows bushier with every passing year, and cascades slightly with the weight of the small fruit. Kumquats, simmered with a little sugar, make a preserve that is delicious over ice cream.

6. *Punica granatum* 'Nana,' from the Mediterranean, is the dwarf pomegranate, and a faithful long-lasting plant easily grown from seed. I unpot them in the summer for garden use where they flower all season. Repotted again in the fall, they continue to bloom for several months with several flowers, at least, turning into fruit. The fruit eventually splits open, revealing the uncountable numbers of seed. Sometimes, as in nature, pomegranates lose some of their leaves in winter. In my cool house I can prevent this and keep a plant well clothed by setting it on the heating mat I use for propagation. Viewing the plants no taller than 2 ft., it is difficult for me to believe that this so-called dwarf came from seed of a tree in Italy that was 8-10 ft. tall.

7. *Ruellia makoyana,* from Brazil, is only one member of a genus with very pretty flowers, mostly pink. *R. makoyana* is commonly grown as a foliage plant, as its small, olive green leaves are veined with silver and have purple undersides. Give it more light and it will bloom on and off all year with rose-pink, funnel shaped flowers. It develops into a large specimen, and I use it as a hanging basket plant.

8. *Serissa foetida,* from Japan and China, is an old-fashioned upright plant with boxwood like leaves and double white flowers. Also blooms on and off all year.

9. *Senecio rowleyanus,* from Africa, bears strings of "peas," "marbles," or "beads" – take your pick. The "peas" are really round, fleshy leaves. While attractive in themselves, it is quite surprising to see a mid-winter show of tiny white flowers appearing all over the plant. It blooms on into spring. Senecio is a genus in the daisy family, and has great variation. The succulent types are particularly adaptable, and root readily as cuttings.

10. *Streptosolen jamesonii,* from Columbia and Ecuador, is a perennial herb in the tomato family. It is sometimes called orange browallia, but its crinkled foliage does not really resemble browallia. I rather prefer its other name, marmalade plant. Its tubular flowers are yellow and buds open to orange suffused with yellow. Bushy and cascading, the flowers appear in clusters at the end of the stems. Full sunlight slowly produces a good sized basket plant. Small plants often show a bit of bloom.

From only these few plants, I feel as though I have glimpsed a tiny bit of scenery from around the world. Discover for yourself that you, too, can travel in such a way. In spite of capricious cultural conditions, the sun will bring many subtropicals into a small measure of the beauty that they possess in their original homelands. Torrid hot-house atmospheres may never again be part of our northern homes, but there are many other ways to grow exotic plants in our indoor winter gardens.

Mail Order Sources for Ten Accommodating Plants – 1980-81

Anthurium scherzerianum
Plants: Logee's Greenhouses
55 North Street
Danielson, Conn. 06239
Catalog $1.00

Seed: Hurov's Tropical Seeds
P.O. Box 10387
Oahu, Hawaii 96816
Catalog free

Begonia 'Richmondensis'
Logee's
Danielson, Conn. 06239
Catalog $1.00

Green Life Gardens
Griffin, GA 30223
Catalog 50¢

Crassula multicava
Kimura International Inc.
18435 Rea Avenue
P.O. Box 327
Aromos, CA 95004
Catalog 25¢

Ficus diversifolia
Plants: Logee's

Seed: Hurov's Tropical Seeds

Fortunella margarita
Plants: Logee's

Alberts & Merkel Bros., Inc.
2210 South Federal Hwy.
Boynton Beach, FL 33435
New Foliage Catalog $1.00

Seed: Hurov's Tropical Seeds

Punica granatum 'Nana'
Plants: Kartuz Greenhouses
1408 Sunset Drive
Vista, CA 92083
Catalog $1.00

Seed: World Seed Service
P.O. Box 1858
Redwood City, CA 94064
Catalog $1.00

Ruellia makoyana
Plants: Logee's

Senecio rowleyanus
Plants: Abby Gardens
4620 Carpinteria Ave.
Carpinteria, CA 93013

K&L Cactus Nursery
12712 Stockton Blvd.
Galt, CA 95632
Catalog $1.00

Both of these firms carry many interesting species of crassula, kalanchoe, and senecio.

Serissa foetida
Plants: Logee's and Kartuz

Streptosolen jamesonii
Plants: Logee's

Seed: Hurov's Tropical Seeds

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Ruby Weinberg is a landscape designer and runs a small commercial nursery at her home, Frog Pond Farm in Califon, New Jersey. She grows there a large variety of rhododendrons and azaleas. Her winter passion is growing subtropicals in her greenhouse.



THE WEATHER:
Is Chicken Little Right?

by Richard L. James

Has the weather gone berserk? Was Chicken Little correct? Was he wrong? Or, was he just ahead of his time? A calm analysis of our weather patterns leads to a clearer understanding of why some television weather performers have reverted to early childhood speech patterns to describe the weather. "A yuk day," or a "good guy day" seems to satisfy our understanding of an environmental factor that might mark the end of our stay on the planet Earth.

Ask any expert if the climate is changing and you soon discover that there are as many opinions as there are experts. Some will proclaim the earth's climate is cooling. Some will suggest that it is cooling quickly, others will say that it's cooling slowly. To add to the merriment, other experts eagerly predict that our climate is warming suddenly. You may pick an expert from Column A (Climate Cooling Quickly), Column B (Climate Cooling Slowly) or Column C (Climate Warming Suddenly).

There are even more questions about the climate's reliability. The most urgent is the question of whether rain patterns are shifting around the world. The answer can again be selected from the column of your choice.

Atmospheric scientists know little about what makes the climate of the earth change. Our understanding of the pathways the changes follows is fairly impressive. For example, there is general agreement that climate changes are cyclic. That is the last point of agreement on that subject. There are as many kinds of cycles as there are "lookers for cycles." The same comments describe the causes of the oft discovered cycles.

There is strong evidence of a 300 year temperature cycle that alternates in a wet to dry, cold to hot pattern that shifts about every 80-90 years. There are folks running around loose who see a lunar cycle, pointing out that many months end with some form of precipitation. The most famous cycle is the 22 year sunspot cycle, which has gained considerable attention ever since settlers initiated dry farming in the western United States. (Crops are planted to take advantage of winter precipitation and are harvested in spring, e.g., winter wheat in Oklahoma and Texas.)

The 22 year sunspot cycle produced droughts in the 1880s, 1900s, 1930s, 1950s and 1970s. Many sky watchers insist the wet-dry cycle of the United States is related to the high-low cycles of sunspots on the surface of the sun. The American Meteorology Society rejects such a connection, but many scientists still mutter, under their breath, that is it true.

Manayunk may be the new ocean front, but the growing areas inland would be much drier than those of today.

One of the fascinating aspects of all the patterns we have discussed is that they rarely cause a change in the total temperature range or precipitation pattern.

For example, our current drought is a source of much amusement in the north central states. Parts of the west coast is beside itself with laughter over the plight of the rain rich east. Folks in Florida and most of the southeastern states join us in a collective moaning. That is a most interesting scenario when you consider the positions were exactly reversed five years ago when the current sunspot began to approach its "solar maximum," i.e., the sun's surface had its maximum number of sunspots or cool storms.

causes of patterns a mystery

So much for the good news. The causes of cyclic weather patterns remains a mystery. One we are unlikely to solve in the foreseeable future. What is more troublesome to climatologists is the message being delivered by these cycles. Is the climate pattern of the earth changing? The answer to that question is easy: yes. Now, the hard part. In what direction is it changing and how fast is it changing?

The answers to those questions may well give us considerable insight into how long the human race's tenure on the planet Earth may last.

Why does the climate change? Our climate merely reflects the incredible restlessness of the planet. Continents drift across its surface pushed by expanding and shrinking ocean floors, mountains are raised and then worn away by the forces of erosion, wind and precipitation. Areas are covered with green plants and then they are stripped away changing the temperature and moisture patterns for a region.

We know that the climate changes because our star, the sun, is a middle aged ball of hydrogen whose outputs of energy vary greatly. The earth's rotation on its axis changes from its current 23.5 degrees to something more or less than that, thus exposing more or less the earth's surface to sunlight. Our magnetic poles wander across the surface and exchange position every 300,000 years.

Changes in sea ice and polar ice coverage can also alter the earth's exposure to sunlight, increasing the amount of sunlight or heat being reflected from the surface. Finally, the composition of the earth's atmosphere changes, which brings us to the most recent potential cause of climate change – the human race.

liberating carbon dioxide

Our desire to combust fossil fuels has caused the human race and carbon dioxide to enter into a relationship never before experienced on this planet. Nor, is it likely to ever be repeated.

We measure the consumption of fossil fuels since the Industrial Revolution. In the first 83 years following the beginning of the Industrial Revolution we consumed some 50 billion tons of fossil fuels. The next 50 billion tons required just 22 years. The most recent 50 billion

continued

tons required just 11 years. Eight years from today, the fourth 50 billion tons of fossil fuels will have been burned liberating carbon dioxide into the atmosphere in unprecedented quantities.

Carbon dioxide is the last ingredient in our changing climate formula. It is a small, but essential gas in the atmosphere whose role is warming the earth by absorbing radiation from the earth's surface and preventing it from dissipating into space. The existing CO_2 cycle has four major reservoirs – the atmosphere, the oceans, green plants and geologic formations, e.g. fossil fuels and limestone. Any increase in CO_2 atmosphere concentrations could lead to increased retention of heating, the much discussed greenhouse effect.

The concentration of CO_2 in the atmosphere has risen from a measured 315 ppm (parts per million–the equivalent would be one tablespoon of vermouth to 8,000 gals. of gin) in 1958 to 336 ppm in 1980. That fact has sent scientists to their computers for two different pictures of the earth in less than 100 years from today. If CO_2 concentrations continue to grow, certain atmospheric patterns are agreed upon.

Growing zones will shift from their present location. The great "breadbaskets" of the world will rapidly experience diminishing precipitation levels. Precipitation patterns in these areas are already marginal for growing. If CO_2 causes the climate to cool, the growing zone will shift southward where soils are unsuited to the current seed grains we are using. The growing seasons will be shorter and drier. Food supply surpluses could become worldwide shortages in less than 25 years.

For the folks who favor a warming climate because of our excessive use of CO_2 the picture is different only in the shift of growing zones northward, but the results will be essentially the same.

Ocean levels around the world would rise, but the amount of worldwide precipitation would diminish markedly. Manayunk may be the new ocean front, but the growing areas inland would be much drier than those of today.

If the current model favoring a warming climate is correct, the average annual global surface temperature will rise about 3°C and by as much as 10°C in the northern polar regions. The resulting warming would alter wind patterns, ocean currents, shifts in rainfall patterns and polar ice cap melting resulting in 5-8 meter rises in ocean levels causing some 11 million Americans living on the coastal areas of the United States to search for new homes. That would just be the beginning of the political and social upheaval we would face, if the earth's climate is indeed warming.

Was Chicken Little correct? There is no certainty that our guesses are correct one way or the other. There are too many things we do not know. How will the ocean's slow heating and cooling affect any atmospheric heating trend? Have all the major global CO_2 reservoirs been filled and how do they interact with one another? How will the human race's control of CO_2 emission impact on the increasing rate of CO_2 concentration? Alternative fuels and increased solar energy will also decrease CO_2 emissions. How will the reservoirs react to a decrease in the atmospheric CO_2?

Questions. Questions. Questions. Our climate is changing. That we know. How and in what direction is still our most important question. How best for the human race to prepare for a change in our climate may be the biggest question of all. We can promise you only one thing, it won't be boring.

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Richard L. James is executive vice president of the Schuylkill Valley Nature Center for Environmental Education. He is an associate professor of science education for Temple University, a member of the faculty of the Pennsylvania State University's Ogontz Campus and visiting lecturer in environmental science at Beaver College. He is a member of the education task force, National Conference on the Urban Environment and vice president of Philadelphia Electric Company's Energy Education Advisory Council. He can be heard on Fridays on radio station WFLN-AM/FM with the Environmental News Report and Five Day Forecast and seen weekly on WCAU-TV as the host of Earthwatch.

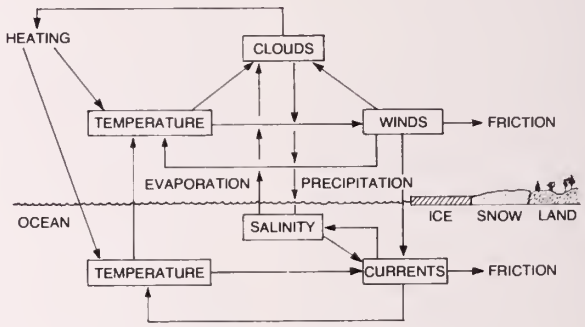


Fig. 1. The major physical components and feedback processes responsible for the maintenance of climate.

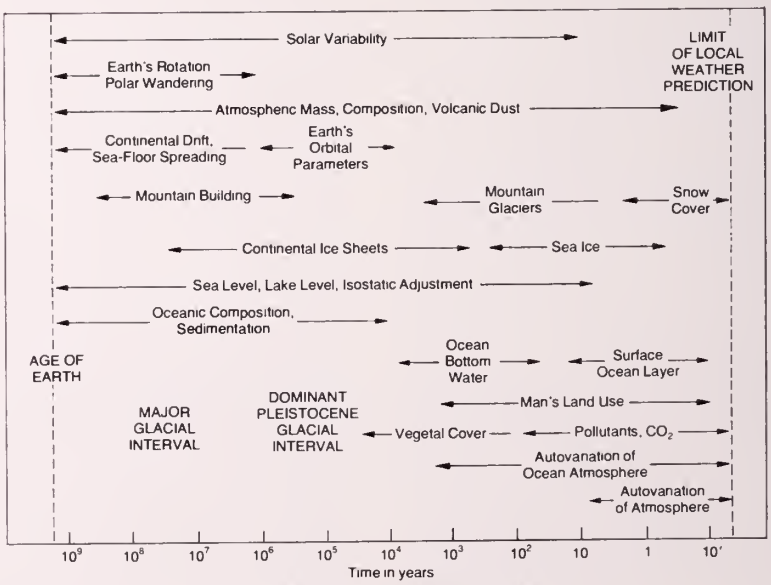


Fig. 2. Characteristic events and possible causes of climatic change (from National Academy of Sciences, 1975)



photos by Jim Kinkade

Heavenly fragrance, glistening dark foliage, waxy blooms and colorful fruit make this orange *(Citrus reticulata)* a great indoor plant. Although the fruit is quite sour, it does grow in profusion.

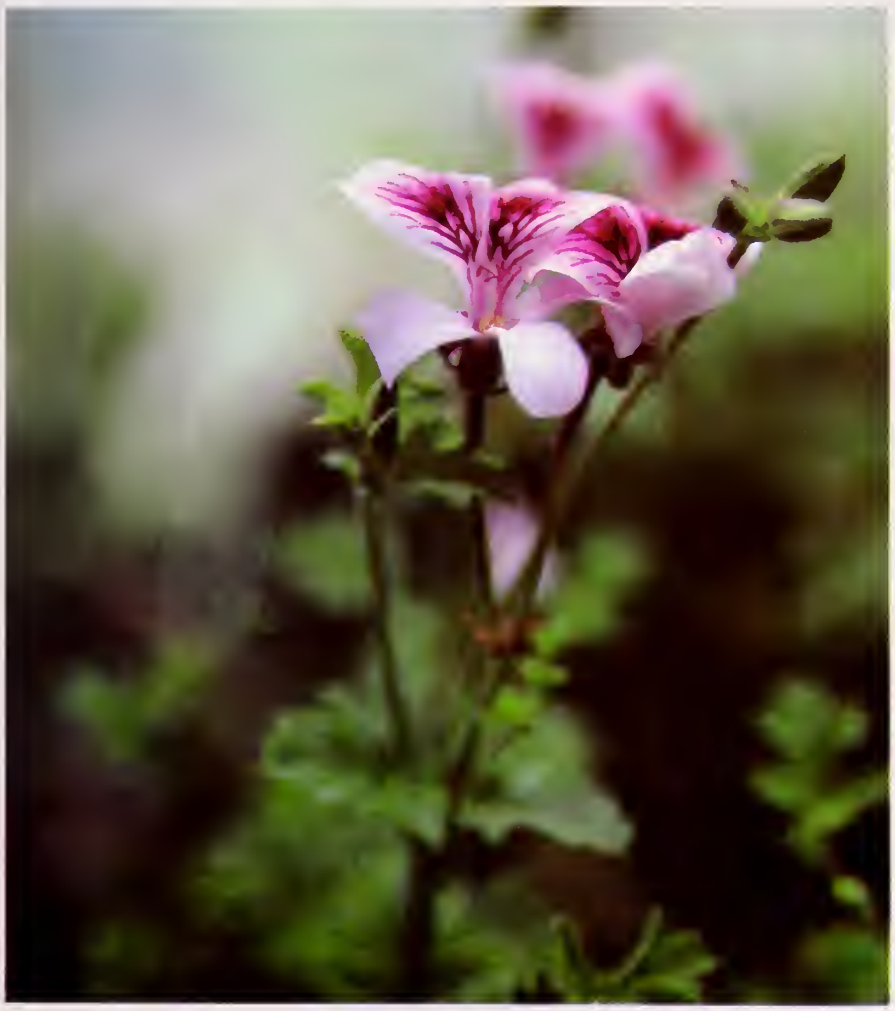
Growing Fragrant Plants Indoors

by Lorraine Kiefer

When the gardening season was finished, I missed the scents of the many fragrant plants that I grew.

The advent of spring had been filled with the anticipation of the fragrances of my favorite viburnum *(V. carlesii),* lilacs, and lilies of the valley. With June came the heady fragrance of the sweet bay or swamp magnolia *(M. virginiana)* growing along our stream mixed with the scent of the roses. Then the summer, with the sweetness of honeysuckle from all the wild spots, the spicy herbs and lavender, and even the annuals such as alyssum and petunia mixing their fragrances. Since many of these flowers and herbs were grown to make potpourri during the season, even my house was fragrant all the time. Yet, that was for a brief time, with the exception of the forced hyacinths and paperwhite

continued



Although scented geraniums are grown for their fragrant foliage, many do bloom with the longer hours of daylight each spring. This strawberry scented geranium not only gives off a sweet strawberry fragrance when touched or brushed, but also has these colorful flowers.

naricssus, my beautiful house plants lacked a distinctive fragrance.

Then one winter, some scented geranium seedlings literally exploded with fragrance when handled. Thus began my interest in fragrant indoor plants. My collection has grown from these few rose and spice scented geraniums to include the fruit scented and many more. They are a joy to grow in a cool greenhouse or even in a sunny window. Mine thrive in both places, but we enjoy them most in a bay window where they get quite cool at night. It's a good idea to have them where they are touched or brushed in passing so their fragrances can be enjoyed.

Scented geraniums *(Pelargonium* spp.*)* respond well in well-drained soil in clay pots. A mixture of equal parts peat moss or well rotted compost, perlite or sand, and garden loam, works well. With clay pots you can water till it flows out the drainage hole, knowing that good air circulation will keep the roots healthy. Water again when the soil dries. A southern or western exposure works best during the winter to produce compact growth and bloom. Although these plants are grown primarly for their foliage, the blooms are a nice bonus.

About the time of my interest in scented geraniums, the orange tree I had planted with one of my young sons several years before began to bloom. Since then, we have added a lime, lemon, and a dwarf orange to the collection. Their fragrance is heavenly and perfumes the house almost all winter. Although they spend summer outdoors on the porch, they are all given spots near windows for the winter. Now at least 5 ft. tall, each is in a large clay pot filled with a humusy mixture of well rotted compost, peat and sand. Their beautiful green foliage is a welcome decoration from October until April in many of the rooms of our home. They are watered frequently and placed on the porch for a quick shower whenever it is mild and rainy during the winter. This shower does wonders for them, cleaning and refreshing them.

plant sitting

Just this past winter I "plant sat" for two carloads of plants belonging to garden writer Barbara Bruno. Many of these were fragrant plants. The one that we have enjoyed the most, the sweet olive *(Osmanthus fragrans),* sat in a corner of our large country kitchen. It was between two windows where it got only morning sun. When Barbara dropped it off in October, she said it had been outdoors for the summer, and was now ready to bloom. As I came downstairs one morning a week later, I noticed an incredibly sweet fragrance. It didn't take long to trace the fragrance to the sweet olive. It is an easy plant to care for, with the same cultural requirements as the citrus trees.

Another fragrant newcomer was the daphne *(D. odora),* more commonly called garland flower. I found the foliage very attractive, but was a bit disappointed that more of the buds didn't reach maturity. The ones that did bloom were much like the arbutus in fragrance. This plant's reluctance to fully flower presents a challenge and now that I've returned Barbara's, I hope to try propagating it so I can continue to experiment with it. Of the two, the olive seems the best choice as it blooms despite all the adverse conditions found in the average home.

There are other fragrant plants that can be grown indoors with just a little extra humidity. A tray of pebbles can provide the humidity needed to encourage the gardenia, jasmine or stephanotis to bloom. The hoya can be placed in a hanging basket and will thrive on neglect, surprising you with fragrant bloom.

Seeds of nasturtium, sweet pea, sweet alyssum, and petunia can all be started either in a small greenhouse or under lights and then be transplanted to hanging pots. Hung in sunny windows, they should bloom from February on, scenting the room with springtime odors.

A few other fragrant plants that I have enjoyed in my home include the herbs: rosemary, pineapple sage, lemon verbena, sweet marjoram, the mints, and lemon thyme. Most of these need a slight touch to release their fragrance, so even tending them becomes a pleasure. All are nice to have in a window garden where a few sprigs can be snipped on a winter day. Place them in a card or letter for a fragrant surprise, tuck in a drawer or closet, add a sprig to a cup of tea, or better yet, combine a handful for a delightfully fragrant tea. Scented plants are fun to grow, since they help to bridge the gap between garden seasons.

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A bay window is a good place to grow plants because it is usually cool in the evening, bright by day, and a bit more humid than the rest of the room. Fragrant plants include daphne in the center, rose scented geraniums, and paper white narcissus. Several begonias add color in this window garden.

Lorraine and Ted Kiefer own Triple Oaks Nursery – Gift Shed. She specializes in the herbs, fragrant plants, and herbal crafts for the nursery and writes her garden columns for local papers *(Franklinville Sentinel,* and *Advertiser).* She also writes an herb column for a Jersey women's magazine and is a frequent contributor to *Green Scene.*

GUNNERA'S JOURNEY:

Can Gunnera Leave Munich and Find Happiness in New Jersey?

by John W. Trexler

Like Medusa's severed head, Gunnera sat on the floor of an open shower in a tiny apartment in Munich, Germany. The sharp hot spray of water removed soil from the many tiny pockets of its thick short roots.

What was meant to be a pocket sized seedling capable of discreet entry into this country, became a full sized "pip," a cubic foot of conspicuous dormant plant life. When I asked Mr. Mueller of the Munich Botanical Garden two days earlier for a seedling of *Gunnera tinctoria* I must have expressed too much enthusiasm.

How does one bring a plant this size into the United States? I had no import authorization and I certainly could not hide the Gunnera. I decided that honesty and purity of heart were the best tactics since I had nothing else going for me.

After Gunnera's thorough hot shower she was set out to air dry. A box was found that could accommodate all but the top three inches of Gunnera's crown. She was wrapped in a plastic bag and packed tightly with paper towels; a hole was cut in the flaps of the box for the protruding bud. All was tied securely with twine, a handle created for easy carrying.

From Munich to Geneva, on a typically gracious Swiss Air flight, Gunnera sat on my lap getting considerable attention from all those who could see her. In Geneva we transferred from our 727 to a DC-10. A flight steward took one look at the package, realized it would not fit overhead or under the seat and suggested, for my comfort, that he take charge of the object. He placed it behind his seat assuring me it would be safe.

After over an hour in flight I went to check on my ward. Gunnera was not to be found. Being basically an honest person I felt what I was doing was second only to international terrorism. I imagined (or fantasized) all the flight attendants had gotten together, decided the package was sinister beyond imagination, and disposed of it. I asked the steward I had dealt with earlier the whereabouts of the package. He did not know, but finally located Gunnera snugly tucked away in an empty compartment in the rear kitchen. One of the other attendants, thinking the package was full of fruit, thought it would be better stored in the kitchen. Gunnera was slowly gaining notoriety. Knowing the plant was safe, I fell asleep, waking just before landing at Boston's Logan Airport.

I was now face to face with the head customs agent of Boston, the man who has the misfortune of dealing with determined horticulturists like myself.

The moment of truth had arrived. Would Gunnera make it safely though customs or become a few ounces of ash in the airport incinerator?

My suitcase passed the agent's scrutiny; the odd shaped box was next. I explained to the agent that it was a plant, and he decided he wanted to see it. Off came the twine, the wadded paper towels, the plastic bag. Voila! Medusa, Gunnera, *Gunnera tinctoria*. Well, needless to say, his mouth dropped open at the sight of this bizarre object. Other agents were called over and without a word the box was removed to a small room down the hall with me in pursuit. I was now face to face with the head customs agent of Boston, the man who has the misfortune of dealing with determined horticulturists like myself. Time had arrived for the explanation:

1. *Gunnera tinctoria*, from Chile.
2. No, I don't have an import permit, but I had applied with the agent in New York. There was some foul-up with red tape.
3. It was a gift from the Munich Botanical Garden to Skylands, the State Botanical Garden of New Jersey.
4. You can't destroy this plant; it would be like destroying the Mona Lisa.

A phone call was made to Kennedy Airport to confirm my story. The agent I had dealt with was at the St. Patrick's Day parade, but his assistant seemed to remember a man from a place called Skylands who had difficulty getting an import permit due to some office foul-up. Boston and New York agreed if the plant passed a careful inspection it could be admitted into the country.

It passed. We were wished luck and headed by bus to my parents' home in Rhode Island where Gunnera was potted up in my father's locally famous compost. The next day by car Gunnera was

continued



Gunnera did not hold back. The first photo shows the initial planting. In the second photo, with her guardian, she shows evidence of a healthy adjustment in her new surroundings after a one year period.

photos by John W. Trexler



off for New Jersey where she rested for three months in a cool greenhouse at Skylands. In June of 1976 Gunnera was planted by the greenhouse staff along the brook in the Bog Garden. She was planted in a mound of sandy loam that had been enriched with great quantities of horse manure. The situation proved ideal. The crown stayed dry while the roots rested in moist rich soil. Gunnera reached her full size during the summer of 1978, a height of over six feet with a leaf diameter better than five feet, and a greenish dense cylindrical panicle of flowers three feet long.

The only special attention Gunnera requires is during the winter. Cold will not harm it but fluctuating temperatures and moisture will. A thick covering of leaves, a layer of plastic, then another layer of leaves is a simple procedure for overwintering success.

Gunnera may be seen in all her glory at Skylands, the New Jersey State Botanical Garden, in Ringwood, New Jersey. Her equally grand division may be seen at the Bamboo Brook Outdoor Education Center in Chester, New Jersey.

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John W. Trexler is superintendent of Horticulture for the Morris County Park Commission, New Jersey.

corsican mint, a fragrant groundcover



photo supplied by Longwood Gardens

The hardy groundcover Corsican mint *(Mentha requienii)* has a potent peppermint scent that could earn it a place in many gardens. The plant is quite unlike other kinds of mint. Stems as thick as buttonhole thread run along the surface, every few millimeters setting roots and advancing little stalks. Leaves smaller than those of baby's tears stretch their surfaces to the light. Stalks bravely start to grow straight up, but bow down after a few sets of leaves, so the mat of foliage reaches no more than a centimeter above the soil. The flowers are purple specks hidden under the leaves.

For such a tiny plant, the fragrance is surprising. A single bruised leaf scents the air for several inches around. A foot treading on a pad of mint disturbs enough cells to throw the odor five feet up for a nose to catch. In the garden at Sissinghurst, in England, carpets of Corsican mint grow over a garden seat. Anyone sitting here must be startled by the encompassing perfume.

The plant does not intend the fragrance to be enjoyable. Fragrant leaves usually defend plants from herbivores, and such is the case with Corsican mint. Small insects and bacteria find the odor and taste unpleasant. The plant produces the odor only when required. Cells in the leaves contain molecules which are a combination of mint fragrance (menthol) and sugar. When attached these have no odor. A browsing animal damages leaves, which breaks cell walls, and the air which enters immediately breaks apart these molecules by the process of fermentation. The sugars stay in the plant, and the fragrant menthols swarm out to ward off the intruder.

Early plant books do not mention Corsican mint. There seems to be no tradition in England of using the plant for medical purposes. Neither Parkinson nor Culpepper, herbalists writing in England in the seventeenth century, mention it, though the modern herbal writer Kay Sanecki says the plant was introduced into England in the late sixteenth century. The first botanist to describe Corsican mint was an English lawyer, George Bentham, who found it growing in the mountains of Corsica and named it *Mentha requienii* in 1829, in honor of Esprit Requien, a French naturalist who may have been a friend of Bentham's. Victorian gardeners valued Corsican mint as as bedding plant. From English gardens it has escaped and formed wild populations in the warm moist mountains of Ireland and western Scotland.

Corsican mint grows well in Philadelphia. It likes a well-draining place, with its roots moist but not wet. In a damper milder climate than Philadelphia's, Corsican mint may need restraining, but here I have yet to see it be invasive; it usually needs defending from encroaching tendrils of more drought-tolerant creepers. It is not particular about pH, and it finds sun and light shade equally acceptable. I have seen it growing among sunny paving stones, on rocky shaded soil, and in tub gardens. The above-ground stems die back in winter, as do those of other mints, but a section of the mat dug in the fall will grow happily through the winter in a pot on a sunny windowsill. It will trail its stems over the sides, offer its leaves to pinch, and remind of spring to come.

Charles S. Thomforde

●

Charles Thomforde first became interested in Corsican mint as a gardener for Ernesta and Fred Ballard in Chestnut Hill, Philadelphia. He is now a graduate student at the University of Delaware.



WHO SHOT THEM?

We won't keep it a mystery any longer. Perhaps you were wondering who the three unnamed photogrphers were in the July issue of *Green Scene*. Their credit lines were inadvertently dropped; we have not located a scapegoat. These shutterbugs deserve acknowledgement: The photos on page 8 accompanying the Nancy P. Howard companion planting piece were taken by Margaret Bowditch. If interested in more of her work, the library has a new set of house plant slides available for rent, and we understand they are excellent.

Edmund B. Gilchrist, Jr., was acknowledged for the cover, but not for his usual magic, which appeared on pages 14 and 15 for the Ed Lindemann "Please Eat the Centerpiece" article.

J. Blaine Bonham is justly proud of the photographs that he shot to accompany his article about vegetable container gardening on pages 22 and 23.

letters to the editor

Our friend, author and Flower Show judge, John Philip Baumgardt of Cassville, Missouri, sent us such an interesting letter that we thought you might enjoy reading it, even though the point he raises in response to one of our articles does not apply here at present. Information about the situation in this area is included at the end of the excerpts from John's letter.*

Dear Editor:

About the Devon Reay musk thistle article *(Green Scene,* May 1981), I think you might wish to check with the Penna. Dept. of Agriculture and similar agencies which get involved in noxious weed control. When Dr. Julian Steyermark published his monumental *Flora of Missouri* in 1963, he listed musk thistle as occurring (sparsely) in four counties, Canada thistle in five counties, and Scotch thistle in three. Today thousands of acres are inundated under impenetrable blankets of these three species, and the cost of bringing them under control to salvage the land for agricultural purposes is very high. Not to mention the environmental problems incurred when blanket spraying huge areas with weed killng chemicals. The problem has become so serious that several states have enacted control laws; Missouri finally came up with one two years ago. It doesn't look like much, but lawyers tell me that the legal interpretation of "every such offense" boils down to $25.00 per thistle, so a badly infested field could be an expensive matter. I am enclosing a copy of the Missouri thistle control House Bill.

The important point for you, it seems to me, is that we have perfectly beautiful native thistles which are not invasive and which serve as handsome garden subjects. In addition, the very stately European *Cirsium vulgare,* while widespread, causes no serious problems so far as I know. It is the bull thistle beloved of goldfinches, and is, in my estimation, the most beautiful of all thistles. Occasionally, we find a pure white one.

Arkansas, so far, has no thistle law. Last week I had occasion to drive to Berryville and passed through hundreds of acres, mostly pasture and hayland, infested with musk thistle. A beautiful but tragic sight.

John Philip Baumgardt

Editor's note: We checked with Richard A. Bailey, the Bucks County Extension Agent, and he told us that musk thistle is not a problem in this area. Its spread is controlled through rosette crown cutting and mowing the thistle as soon as it blooms.

*Books by John Philip Baumgardt: *Bulbs for Summer Bloom,* Hawthorne, New York (1970); *Hanging Plants for Home, Terrace and Garden,* Simon and Schuster, New York (1972); *How to Care for Shade and Ornamental Trees,* Intertec Pub. Corp., Kansas City (1974); *How to Prune Almost Everything,* Barrows, New York (1968) – available in paperback also; *The Practical Vegetable Gardener,* Quick Fox, New York (1978).

the plant finder — A free service for *Green Scene* readers



If you can't locate a much wanted plant send your name and address (include zip), the botanical and common name of the plant to Plant Finder, Green Scene, PHS, 325 Walnut St., Philadelphia, PA 19106. People who have the plants or seeds you want will contact you to make arrangements about selling or giving them away, mailing, etc.

WANTED

***Caryopteris clandonenis* 'Blue Mist,'** called bluebeard.
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▼

Pinus sabiniana, digger pine.
Contact: Peter J. Knop, Route 1, P.O. Box 204, Chantilly, VA 22021

▼

***Malus halliana* 'Parkmanii,'** crabapple.
Contact: John Pelligrino, 155 Walnut Lane, Manhasset, NY 11030

▼

***Verbascum* 'Silver Spire.'** For many years I grew a verbascum that came from England called 'Silver Spire.' I believe it was, in fact, *Olympicum Boiss [sic].* I have tried several seed merchants; one sent a seed of so-called 'Silver Spire,' which in no way resembles the original, it not being gray-leafed. I wonder if any of your readers still has the original.
Contact: Sir John R. H. Thouron, Unionville, PA 19375

▼

FREE TO A GOOD HOME IF YOU DIG OUT: large, fragrant old-fashioned, single-petaled yellow rose. Probably 'Father Hugo' (p. 4, May/June '78 *G.S.).* Now planted in shade near garage and too pretty to destroy, too thorny to leave.
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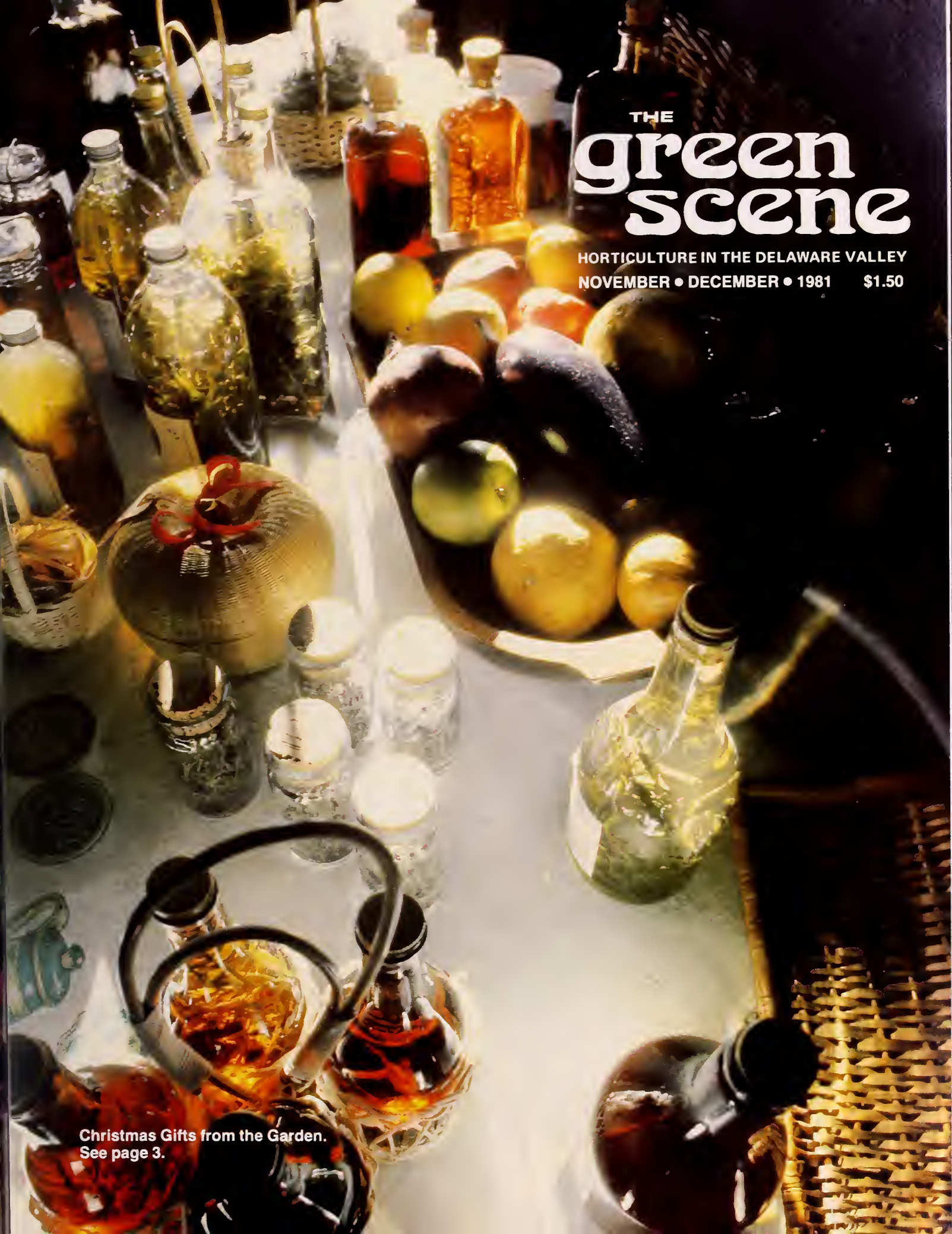
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The diffused glow of hazy, early evening light catches insects still at work among prickly, bronze highlighted flower centers and softly illuminates from behind the vivid pink daisy petals of *Echinacea purpurea*. See page 17.



THE green scene

HORTICULTURE IN THE DELAWARE VALLEY
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photo by Edmund B. Gilchrist, Jr

Back Cover: Perennial border in a city garden
photo by Mary Lou Wolfe

THE
green scene
HORTICULTURE IN THE DELAWARE VALLEY

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Preparing for Christmas in the Herb House

by Julianne R. Street

What do you give a famous chef for Christmas – especially if the chef is an Apple Pie Farm customer for herbs? It seemed obvious that such a present should be edible, or at least an ingredient for some great dish he might create – unique, attractive to the eye and possess some attributes for conveying the spirit of Christmas. Of course it had to be connected in some way with herbs and couldn't be "store bought." Although I did not know it at the time, our Christmas decoration business was being born as I tried to decide what to make for this particular present.

In ancient Athens fashionable gentlemen included thyme in their toilet kits and to say that one "smelled of thyme" in those days was high praise indeed.

First of all, the choice of herb was important: it should be available in season and should relate to the person it was chosen for. Thyme was chosen for this particular man because it is the symbol of courage and is also a versatile herb. It is grown almost everywhere in the world and for centuries has been used in foods, liquors, as a strewing herb and in baths. In ancient Athens fashionable gentlemen included thyme in their toilet kits and to say that one "smelled of thyme" in those days was high praise indeed. It is pretty, fragrant, has many uses and is popular with good chefs. So my first Christmas present was a 12-in. kissing ball made of French thyme with a red velvet bow with streamers at the top and a bunch of mistletoe with lots of plump white berries tied with narrow red ribbon attached at the bot-

continued



Dottie Collins and Judy Street tying ribbons for boxwood kissing balls at the Herb House.

photos by Edmund B. Gilchrist, Jr.



Table tree made of boxwood



Thyme wreath



Dried herbs and statice wreath



Boxwood kissing ball with baby's breath



Dried sage wreath

tom. The grey green of the thyme contrasted beautifully with the bright red of the ribbon. The result was a Christmas decoration that was pretty, edible and fragrant – especially when misted. It was designed to provide fun for the spirit as well as pleasure for the palate.

We made it on a 6-in. styrofoam ball by sticking each branch of 3-in. thyme into the styrofoam. It was a long and tedious task. However, we practiced on small 2- to 3-in. balls before making the big one and found the best method was to put a piece of florist wire through the center of the ball, make a loop at both ends, cut the little branches of thyme into equal lengths and stick them into the styrofoam one by one, after determining what size the finished ball should be. By having the thyme branches the same length we didn't have to trim the ball when it was finished thus avoiding stubby ends.

When these small balls were trimmed

continued

with ribbons and mistletoe they were so charming that we became enthusiastic about making them to sell. We also made a fairly large wreath of thyme – also on styrofoam but it and the kissing balls took so much thyme *and* time that we decided that they were not practical to make for commercial purposes. They last a long time, however, and can be used for Christmas year after year, and the fragrance of the thyme can be easily restored by misting with water. The one wreath that we made is still pretty and fragrant, and I use it on my front door every Christmas.

The recipient of the kissing ball told me recently that he had kept it hanging in his home for three years. He did not tell me whether its primary use had been culinary or other, and I did not ask.

When we learned that the thyme balls and wreaths were too expensive to sell commercially we turned our attention to boxwood and started making kissing balls and wreaths from that. They were less expensive to make of course, both in time and materials, and the balls have proved to be very popular with our customers. In the beginning we made the balls on apples and/or styrofoam but they did not keep as well as we had hoped so now we make them on wet oasis inside a cage formed of chicken wire so that they can be kept wet (see illustration). A friend told me in June that the ball she bought last December was still hanging in her living room – green and beautiful. Also, we make a huge one (weighing about 40 lbs., about 22 in.) for a restaurant in Washington every Christmas, and I know that it has been kept green and hanging as late as April of the following year.

Last year we added sprigs of dried baby's breath to some of them after they were finished and these delicate white blossoms mixed with the boxwood gave them a lovely airy appearance. In addition to the all boxwood wreaths, we make some of boxwood combined with various other evergreens and decorate them with small bunches of dried herbs, berries, flowers, fruit and/or pine cones. We make them on wire frames filled with wet sphagnum moss by sticking the small branches of the evergreen into the moss and securing them where necessary with florist wire. These are particularly pretty made on 6- and 8-in. frames.

dried and fresh herb wreaths

Last year we made our first wreaths from dried herbs. In the beginning we made them on 8- and 10-in. wire frames and wrapped them with florist wire. These, too, took a lot of herbs as well as a lot of time, making them expensive, so we next experimented with a foundation of dried statice on the same type of frame and nestled small bunches of both fragrant and culinary herbs in it. Both were pretty. The all-culinary wreaths were very fragrant with garlic chive blossoms, mints, rosemary, sage, tarragon and thyme acting as the star feature, but they took more herbs and time to make than the statice wreaths, which were perhaps more delicate in appearance. But for both, the pink blossoms of chives, the blue and red of the lavender and salvias, the purple of the mint blossoms and the rich color of the opal basil added color. The bright green feathery foliage of the dill and fennel furnished contrast and gave interest. The lovely fragrance of lemon balm, lemon basil and lemon verbena were a delight to smell and the sweet woodruff with its scent of new mown hay reminded me of summer pastures.

The other wreaths of dried herbs that we make are small and are made of just one herb on 6-in. styrofoam forms which are sprayed on the back with grey paint that can be used on styrofoam. The small leafed herbs such as sweet marjoram, lavender, dwarf sage and thymes are best for these. We dried them in small bunches and secured them to the frame by wrapping with buttonhole twist thread. We made a hook of florist wire and fastened it to the top of the frame before putting the herbs on it. This hook is sometimes useful for hanging it to get a distant view of progress while it's being made. These wreaths are dainty and delicate with a concentrated fragrance



Boxwood wreath



Left to right: Blanca Hunt, Anne Liebert, Cecilia Cooney and Giselle Witte work on wreaths and trees.

of the particular herb used. The one of sweet marjoram is especially delightful as it is the one herb that is more fragrant dried than fresh, and it is extremely fragrant when fresh. We decorate them with tiny bows of narrow ribbon – green, red or gold – or perch a tiny golden angel on the top. All of these wreaths can be used to hang or to use as rings for candles.

This summer we made wreaths of fresh herbs on bases of dried grapevine. They were lovely and so successful that we will experiment with them using dried herbs this Christmas. Those made of fresh herbs were used around hurricane lamps for centerpieces.

christmas trees for the table

To the baskets of dried herbs, herbed pecans, herb flavored vinegar and other goodies we prepare for our customers at Christmas time, we have added a small table Christmas tree. We make it of boxwood on wet oasis molded into a cone shaped cage of chicken wire and place it in a shallow pan so that the tree can be watered. An aluminum pie pan is suitable for this – and a music box base is especially nice if you can find one.

A good plan to follow in constructing the tree is to build up a single line on one side to determine the finished size and then break the boxwood into the appropriate lengths needed for the various levels. It is preferable to break rather than cut it as the sharp pointed ends are easier to insert in the oasis than blunt ones and be sure that the oasis is thoroughly wet before constructing the tree. It can be decorated as any Christmas tree with miniature candies wrapped in bright foil, candles, berries, birds, fruit, flowers, tinsel, popcorn, peppermint canes or with anything that is pretty or amusing.

So in trying to choose a Christmas gift for a special person, a small business developed. The recipient of the kissing ball told me recently that he had kept it hanging in his home for three years. He did not tell me whether its primary use had been culinary or other, and I did not ask.

●

Judy Street owns and operates Apple Pie Farm, which is located between Malvern and Phoenixville in Chester County. She has approximately five to six acres under cultivation in culinary herbs and sells them and herb related products to restaurants and gourmet shops throughout the United States. Articles about herbs and other by-products from Apple Pie Farm have also been published in *Green Scene,* September, 1980 and January, 1981.



winter watering

by Bonnie Jane Swan Day



photos by Carl Burnam

Always check soil before watering *Ficus benjamina*.



The fronds of the fern on the left, a Boston fern cultivar *(Nephrolepsis exaltata* cv.) indicate excessively dry soil. (It recovered.) Plant on right is davallia.

Here on the sunporch, as I admire the lush green foliage of my avocado, I am hard-pressed to recall the trials and occasional triumphs involved in nursing my plants through the winter months from November through February. Houseplants are so easy, so satisfactory during the summer: they look well, they grow well, they respond. It is ironic that the time of year when most houseplants are at their worst is when we need their presence most. Winter demands a different, more thoughtful sort of relationship with our indoor plants. I love them in a special way then, with a mixture of exasperation, hope, and pride that many people feel for their botanical children.

Water is a pivotal part of that relationship. Very often it is what determines whether you will be feeling exasperated, hopeful, or proud. Overwater a plant in the summer, and chances are that it will

survive. Overwater that same plant six months later, and you may well have written its death sentence.

Perhaps the best way to appreciate the role of water is to understand its importance to plants. Water comprises 80-90% of a living plant and is part of many physiological processes. It helps to maintain relatively even temperatures within the plant by absorbing heat and cooling the leaves through transpiration. Water is both the solvent and the carrier for essential chemical substances, as well as a raw material in biochemical reactions. Plants' cells must be turgid, filled with water in order to get the carbon dioxide they need for photosynthesis.

The combination of cool temperatures and excess water is especially conducive to root rot.

Despite the generally slow, somnolent air winter brings to most houseplants, water continues to be used in the ways I've described. What is different about water in winter is that almost all plants require less. Shorter days, lower light, and cooler temperatures reduce the rate at which the plants grow and use essential elements like water. Some plants slow down so much that they become dormant, using little or no water. Others seem to give no indication that they are aware of the season, though most plants are less active during that time. There are exceptions of course – winter blooming plants like the Christmas cactus *(Schlumbergera bridgesii)* that must have water in abundance from the time they have set bud until they are done flowering.

How much water to give plants, and when, is best determined through careful observation of the plant, an awareness of the environment around it, and a little research or consultation with your favorite plant book. Like people, plants are individuals too. There are so many variables that determine a plant's water requirements that it is well nigh impossible to make exact recommendations, or to give formulas for when and how much to water. Indeed, most experts refuse to be more specific than "barely moist" or "slightly drier."

Plants' environments have a great deal to do with the amount of water they use. In greenhouses the extra warmth, light, and humidity precipitate more plant activity thus requiring more water than their house-grown counterparts. A centrally heated home with the thermostat set at a constant 70° will produce plants that dry out faster than those growing in cooler air. The high daytime/low nighttime temperatures and dry air caused by a wood stove make extra humidity and soil moisture essential during the day: watering plants well in the morning avoids wet feet at night.



The umbrella plant *(Cyperus alternifolius)* grows in year-round.

the weather

The weather influences indoor plants' water needs, too. On a sunny, snow-covered day plants will absorb the water you thought would last for several days. Conversely, a week of short, cloudy winter days can serve to stall plants for what seems an impossibly long time. I remember one long, rainy November when my job in a greenhouse consisted chiefly of clearing out foliage with grey mold, and wishing things would dry out a little.

Where plants are placed is important. A hanging basket dangling in the hot, dry air near the ceiling will require much more water than the plant sitting in the colder air near the floor. I lived in a house heated primarily with wood for several years, and found that one of the benefits was the creation of several different growing situations. The room where the stove was located was quite warm during the day, and it was there that I kept plants that wanted warmth and water during winter. Plants that would submit to the trade-off of cooler air, lower light, and less water, like my weeping fig *(Ficus benjamina),* Norfolk Island pine *(Araucaria heterophylla)* and ferns, went into the cooler dining room on the other side of the house. Upstairs, in the coldest room, slept the cacti, their dormancy and subsequently reduced (or nonexistent) need for water aided by the cold.

Of course, the most important variable to be considered in winter watering is the plant itself. You must understand the plant's requirements. Begin by learning its cultural needs and where it is from – this information will provide insight about the environment it requires. Check on each plant regularly, to better understand how it grows. This combination of information and personal observation is the best possible insurance against irreversible mistakes. Because plants are so slow-growing during winter, they may take much longer to recover from the effects of improper watering. The combination of cool temperatures and excess water is especially conducive to root rot, too. I still sigh for my velvetleaf *(Kalanchoe beharensis),* which collapsed into mush overnight, suffocated by one too many thoughtless waterings.

The solution: always examine the soil before giving any plant water. Techniques for testing soil moisture abound, from knocking on pots to moisture meters (which I do not recommend – there's no better way to lose touch with a plant). For me, the color of the soil is the first clue: its color may range from darkly wet to pale, bone-colored and dry. Stick a

continued

winter watering

continued

forefinger into the soil and move it around a bit to determine if the surface dryness is just a tease, or extends further down the pot. Look at the foliage and overall appearance of the plant. Many plants droop, wilt or wrinkle when they need water; the leaves and stems are no longer turgid. Others, like ferns and Swedish ivy *(Plectranthus* sp.*)* turn slightly blue. Try to keep the root system of the plant in mind – shallow-rooted rhizomatous begonia will do well with

Water comprises 80-90% of a living plant and is part of many physiological processes.

frequent dribbles of water designed to keep the surface roots from drying. More deeply rooted plants prefer to be well-watered, then allowed to dry. Generally speaking, I've found it best to err on the dry side when watering, particularly in winter. I've also learned that it is important to be consistent. Once you have decided to let a plant go dry for the season, don't confuse it with erratic outbursts of "kindness" in the form of extra water. A streptocarpus I kept quite dry for many winter weeks could not tolerate the same droughty conditions after several forgetful waterings.

When to begin winter watering is rarely clear-cut. Most often, I notice in the course of my regular visits to each plant that its growth has slowed, or that it still hasn't absorbed the water I gave it the last time. The plant is really the one that initiates the winter schedule. There are plants that need to be carefully dried off, or caused to become dormant, in order for them to bloom or survive; but I have had very little experience with them.

Humidity – water in the air – is another important facet of winter watering. The warmer the air in a house is, the less moisture it can hold and the lower the humidity. Most plants prefer humidity in the range of at least 30 to 50%. They try to maintain equilibrium between the moisture in the air surrounding their leaves and the leaves' interior, through the process of transpiration. When the external atmosphere is relatively dry, water vapor evaporates from the leaf, beginning a chain of water movement up and out of the plant that draws from the roots. Soil moisture can be depleted in this way without the plant's having used it. In view of the disparity between ideal and actual humidity, and the consequent steady loss of moisture from the leaves, it is easy to understand why leaves turn brown at the edges and dry during the winter. The best way to avoid this drying and waste of water in the soil, is to supplement the humidity immediately around the plant, by means of a humidifier or pebble trays partially filled with water, on which the plants may be set. If you have a wood stove, a pan of water simmering on the top is beneficial to both plants and people. Misting, unless you are prepared to do it often, is only slightly helpful.

Once the slow decline of November and December and the January doldrums have passed, the latter part of winter – February – is far more encouraging. Many plants, feeling the benefit of increasingly longer days and stronger sunshine, begin to perk up. You'll find yourself filling the watering can more and more. A new fiddlehead, a less sulky avocado hint at the approach of spring. Another winter is waning, and with it the cold weather challenge of keeping indoor plants alive and well. Winter watering can be tricky but, like most things, practice and careful attention go a long way toward mastering the technique and meeting the challenge.

●

Bonnie Day enjoys gardening both indoors and out. She has gleaned much of her plant knowledge from a variety of plant-related jobs and personal experience, and is now working at the Wilmington Garden Center.

SOME SUGGESTIONS FOR WINTER WATERING*

Dry	Reduced	Regular
Christmas cactus *(Schlumbergera bridgesii)* in November	Christmas cactus after bloom, until spring	Christmas cactus after bud set, during blooming
Blood lily *(Haemanthus katherinae)*	Asparagus fern *(Asparagus densiflorus* 'Sprengeri')	African violet *(Saintpaulia* hybrids)
Cacti	Avocado *(Persea americana)*	Boston fern *(Nephrolepis exaltata* cultivars)
Hoya bella	Crown of thorns *(Euphorbia milii)*	Grape ivy *(Cissus rhombifolia)*
Jade plant *(Crassula argentea)*	Norfolk Island pine *(Araucaria excelsa)*	Ivy *(Hedera helix* cultivars)
Night-blooming cereus *(Epiphyllum oxypetalum)*	Rabbit's foot fern *(Davallia fejeensis)*	Spider plant *(Chlorophytum comosum* cultivars)
Pony-tail palm *(Beaucarnea recurvata)*	Staghorn fern *(Platycerium bifurcatum)*	Swedish ivy *(Plectranthus* spp.)
	Weeping fig *(Ficus benjamina)*	Umbrella plant *(Cyperus alternifolius)*

*Remember – everything is relative. Most plants use less water in winter; apply these suggestions with that in mind. The plants in the "reduced" column should be given cooler temperatures as well. Your experience with the same plants may differ.

Decorating Churches at Christmas

by Charles Rogers

At Christmas play and make good cheer
For Christmas comes but once a year. Thomas Tusser



photos by Charles Rogers

Altar arrangements: English holly, Nordmann fir, chamaecyparis and nandina.



Evergreen wreath (42 in.) made of *Taxus cuspidata* and chamaecyparis. Decorated with English holly and nandina fruit and #9 velvet ribbon.

These two lines are all that I remember of the poetry my grandmother began reciting each Thanksgiving Day and repeated at regular intervals until Christmas Day. This time was for sharing in the preparation, the joys, traditions and all the wonderful events of the season.

Nowhere are these more time honored Christmas traditions observed than in the churches, starting with the season of Advent and continuing through Christmas to the Twelfth Night. Decorating the church for Christmastide can be a joy and pleasure. I've outlined here some bits of tradition and ideas that are still observed at my own church.

the advent wreath

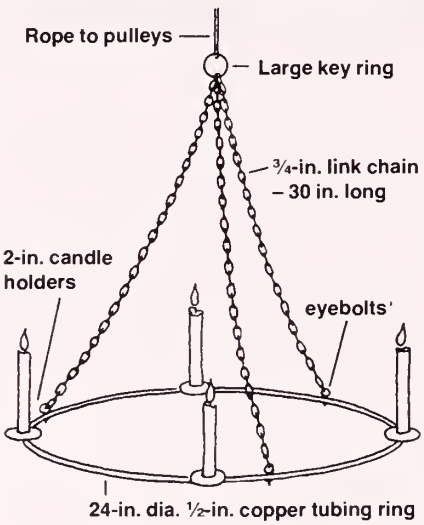
Advent, about four weeks preceding Christmas, is a time of expectation and preparation for the birth of the Christ Child. A traditional part of the observance is the Advent wreath, which has roots in the English and German churches. The Advent wreath is appropriate for use in the home as well as in

continued

the church. Its diameter can be any size, and it is made of evergreens: yew in some English traditions and fir in some German traditions. The wreath is used in the horizontal position and can be placed on a table, a tall stand or suspended from the church ceiling by a series of chains, rope and pulleys, looking for all the world like an evergreen chandelier. Placed in holders in the wreath are four candles, one for each of the Sundays in Advent The color and size of the candles vary with traditions, the most common is three purple and one rose candle for the Advent season and changed to four white candles for Christmas Eve, Christmas Day and the Sundays to Twelfth Night. A prescribed order is followed for lighting the candles: one on the First Sunday, two on the Second, three (two purple and one rose) on the Third, and four on the Fourth. At Christmas they are exchanged for four white candles and lit at services thereafter till the end of the season. Some traditions use a fifth candle in the center of the wreath which is first lighted on Christmas Eve as the Christ candle.

I use an Advent wreath first made more than 15 years ago and redecorated each year since.

The frame is 24 in. in diameter and made of ½-in. soft copper tubing joined together with a copper coupling to form a circle. Four low metal candle holders, holding 2-in. diameter candles, are bolted to the frame and spaced equally at 3, 6, 9 and 12 o'clock. Three eye bolts are attached through the frame at 1:30, 5:30 and 9:30 o'clock. Attached to each of the three eye bolts is a 30-in. piece of ¾ in. loop chain, the ends of which are in turn attached to a large heavy-duty key ring forming the necessary suspension for the wreath. The key ring is attached to a rope strung through a series of pulleys that permit it to be raised and lowered while suspended from the church ceiling, so that the candles can be lighted and extinguished. With the frame, rope and pulleys all in place, let us turn our attention to the making of the evergreen wreath.



Hanging Advent Wreath Frame

Candles and Evergreens

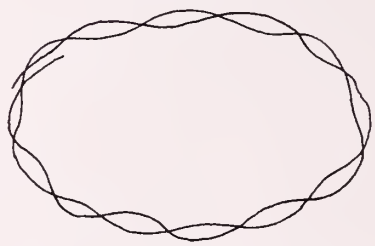
Whenever possible the greens should be sprayed with Wilt-Pruf and a fireproofing material to retain as much moisture as possible. A rule to follow is never to let a candle burn lower than 5 in. from evergreens. Replace greens when they become dry. Common sense, an observant eye and care when lighting can assure safety with candles and evergreens.



Della Robbia wreath. This 17-year-old fruit and cone wreath is mounted on a *Taxus cuspidata* wreath.

The diameter of the evergreen wreath should be the same as the Advent wreath frame – in this case use a 24-in. frame. It can be a commercial wire frame, or a hoop or form made of long privet or forsythia whips (see illus.). I've found that the best evergreens for an Advent wreath are the yews: *Taxus cuspidata, Taxus cuspidata* 'Nana' or *Taxus cuspidata* 'Densa.' After the wreath is completed, don't forget to wilt-proof and fireproof. For freshness and safety, make a second evergreen wreath to replace the original after the fourth Sunday in Advent. Attach the evergreen wreath to the frame, in the key ring wire or tie large purple bows with long streamers. Next place the candles in the holders; a small amount of florist clay or similar substance on the base of the candles will insure that they will stay straight and firm. Light the candles, raise the Advent wreath to the desired height and tie the rope off. There suspended from the ceiling is the first church decoration of the Christmas season.

Woven Hoop



8 in.-14 in. diameter hoops require 1 6-ft whip. Hoops with a larger diameter require 2 6 ft.-8 ft. whips. Wire hoops require a piece of wire 6½ times the diameter of the hoop.

wreaths

There are numerous ways to hang the evergreen circle in the church decorations: on church doors, walls, windows, chancel rails and in the chancel. The two most handsome and effective wreaths are the Della Robbia type and the decorated evergreen wreath.

The Della Robbia, as it is most often referred to, is modeled after the ceramic art works of Luca Della Robbia, a 15th century Italian artist and sculptor, who was noted for his fine glazed terra cotta works. Many were framed with a glazed wreath of fruits, nuts and flowers. The present day wreaths are usually made with nuts, dried material, cones, and artificial fruit, constructed on a wreath frame base. To be more precise perhaps the Della Robbia type wreath should be referred to as a fruit and cone wreath.

The fruit and cone wreath in the photo was made 17 years ago and has been used each year since. Only minor replacement of damaged cones has been necessary over the years. A clear coat of flat finish lacquer is sprayed on

the wreath every two or three years to preserve the cones and retain its fresh look. The wreath was made on a 16-in. base and is wired each year to a new fresh yew wreath, which is made on an 18 in. base providing a handsome green background for the Della Robbia.

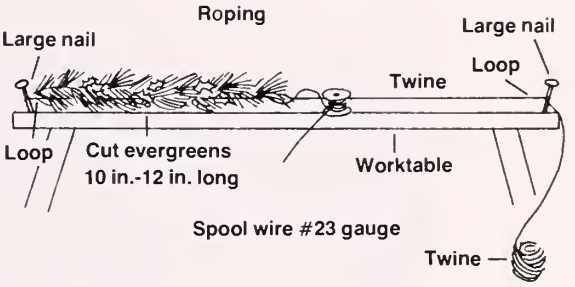
The decorated evergreen wreath can be made any size to meet the requirements of the location where it will be hung. A mixed evergreen wreath using two or more varieties of yew, nordmann fir, boxwood or cypress makes a wreath of interest and contrast. You can let your imagination go when decorating the wreath using natural materials. Begin with holly, then add bayberry, red berries, cones or dried material. If the location warrants it, red velvet ribbons and bows can be added for brightness and color. The decorations can be attached to florist wire picks and then pushed into the center of the wreath, or they can be wired onto the wreath.

swags

Swags have the right shape for use on pillars, columns and on the long narrow panels surrounding the chancel. Swags are easily created by pushing cut evergreen boughs into rectangular pieces of 2-in. thick green styrofoam; the length of the styrofoam will vary in proportion to the size of the swag. (Note: when cutting the evergreen boughs be sure to cut on a 45° angle, providing a pointed end for pushing it in; it will hold much better than a flat cut.) Yew and nordmann fir seem to be best for this purpose, holding their green color and needles even after drying out. The swags can be decorated in the same fashion as the wreaths in the church. Della Robbia swags can be handled the same way the wreaths are handled. Decorations attached to wired picks are easily applied; the pick works beautifully in styrofoam. A note of advice to the beginners: be sure to make provisions for hanging the swags before you start with the evergreens, since it is easier to add picks and wires to an empty styrofoam block. (For detailed instructions for making a swag, see *Green Scene*, November 1980.)

roping

Well-made evergreen roping is a joy and delight to use in decorating. It accents and frames the other decorations. White pine makes a handsome and graceful roping but can be rather sticky to work with; Hicksii yew and Moon's columnar yew are easily worked and seem best because of the natural growth habit. Laurel roping is the old standby and should not be overlooked. The key to success in making roping is to use a twine base, which must be stretched taut. The greens are attached in a fashion similar to making a wreath and secured so as not to sag. This can be accomplished by tying a loop at the beginning of the spool of twine and attaching it to a nail or hook at one end of a worktable. Stretch the twine tight and hook it around a nail at the other end of the table. Don't cut the twine until it's as long as you need it. When you are making the roping and you reach the second nail, simply unhook the twine taking the loop off the first nail and move



the back loop to the first nail and repeat the process. The greens are cut 10-12 in. long and placed with some on top and some on the bottom of the twine, then wrapped tightly with florist wire. The procedure is repeated until the desired length is reached. The amount of greens to use is determined by the size and thickness of the roping. Of all the Christmas decorating projects the making of evergreen roping takes the most perseverance.

evergreen arrangements

Fresh cut flowers are usually placed each Sunday in the chancel; however, a beautifully proportioned arrangement of fresh evergreens, accented with natural berries is a perfect change for Christmas. *Magnolia grandiflora* with its large and glossy leaves provides a wonderful accent when used as a contrasting background for the potted poinsettia. There are dozens of interesting varieties of evergreens that should be used more often at Christmas. What better way to continue the longstanding traditions of Christmastide, than to use fresh evergreens to decorate our churches.

●

Chuck Rogers is curator of horticulture at the Philadelphia Zoo. For many years he was associated with a Christmas shop in Norristown. In 1978 he prepared the Christmas decorations for the Zoo's house, Solitude, as part of the Fairmount Park Houses Christmas tours. Each year Rogers grows a large crop of nandina, especially for Christmas at his home and for his local church.

The author's favorite cut evergreens for church decorating:

Arrangements

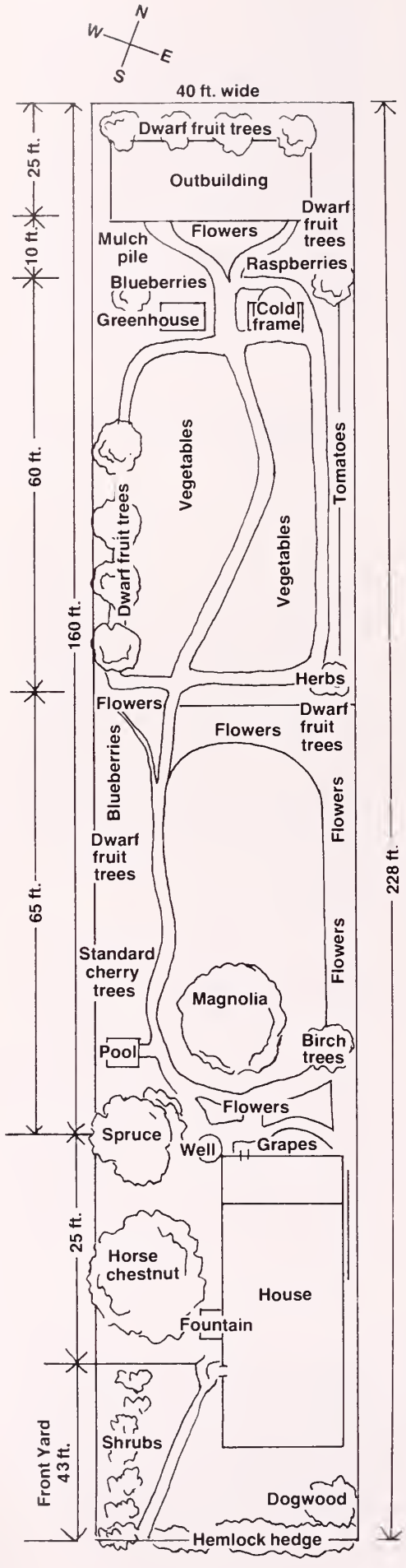
Abies concolor	- white fir
Abies nordmanniana	- Nordmann fir (Noble fir)
Buxus sempervirens 'Arborescens'	- tree boxwood
Cedrus atlantica 'Glauca'	- blue atlas cedar
Cedrus deodara	- Himalayan cedar
Cedrus libani	- Cedar of Lebanon
Chamaecyparis spp.	- cypress
Ilex aquifolium	- English holly
Ilex opaca	- American holly
Magnolia grandiflora	- Bull Bay or southern magnolia
Pinus flexilis	- limber pine
Pinus strobus	- white pine
Pseudotsuga menziesii	- douglas fir
Thuja occidentalis 'Elegantissima'	- Arborvitae

Roping

Kalmia latifolia	- laurel
Pinus strobus	- white pine
Taxus cuspidata 'Hicksii'	- columnar yew
Taxus cuspidata 'Columnaris'	- columnar yew
Taxus cuspidata 'Nana'	- dwarf Japanese yew

Wreaths

Abies nordmanniana	- Nordmann fir
Buxus sempervirens	- boxwood
Chamaecyparis spp.	- cypress
Taxus spp.	- yew



The Collector's Garden:

BUILT FROM TRASH AND FOUND OBJECTS

by Harriet Benedict Heaney

One-fifth of an acre in the city, with the original well still intact, produces an abundance of flowers, vegetables and fruit. The garden has been developed using efficient spatial and succession planning. Cost is often reduced by incorporating trash or found objects; for example a sitz bath, old storm windows, sponges and the bottom of a shower find new uses in this collector's garden.

Twenty years ago we found, in the Mount Airy section of Philadelphia, the house and yard we had always wanted. The lot is long and narrow, 40 ft. wide by 228 ft. deep. The house, built about 1832, is within 25 ft. of the street. It is set almost on the line on the north side, thus leaving space at the south for a bricked yard, where a horse chestnut shades both the inside and the outside of the house. It also provides a degree of excitement in the fall when the squirrels forage for nuts in its branches. The original well, 15 ft. deep and stone lined, lies at one corner of this area near the door to the kitchen and serves as a cistern for rain water from the back roof. We have fitted it with an electrical pump and use the water in dry spells on the lawn and in the garden. At one side of the bricked yard we have set up an old sitz bathtub, encased in wood, which serves at once as the reservoir for a fountain and a stand for indoor plants airing during the summer.

The front yard, 40 ft. deep, is protected by a hemlock hedge at the sidewalk, with dogwood to the north and shrubs along the walk to the door on the south side of the house, an arrangement that gives adequate landscaping for the house but does not waste space. The bulk of the lot is at the back of the house, an open space 135 ft. deep. Since the former owners were away all summer the back yard was primrily grassed, with privet hedges along each boundary and a clump of lilacs at one side. This open space was an invitation to enthusiastic and inexperienced planners.

Originally flowers bordered the north side of this yard; it was divided from the lawn by a low wire fence as the area was used primarily by our three-year-old and his friends. At the far end of the lawn we opened up two small vegetable plots, 100 sq. ft. in all. When he was ten years old, our son decided that he would do the vegetable gardening. We increased the space to 1500 sq. ft., for he was ambitious. He read catalogs, followed instructions, and had a fine garden. After a year, however, his interest waned, and I was back in peas and beans on a larger scale. From that point our garden developed by stages to the form shown in the accompanying diagram.

trial and error

In developing our garden we have tried to use space efficiently, to minimize cost by turning all kinds of trash to account, and, through experimentation, to find both common and unusual plants that adapt well to our environment. Trial and error has always been a main approach in reaching our goal. How many times had I seen a pretty little blue flower in someone's grass *(Veronica officinalis)* before I carried it home, only to discover that it wanted to take over. I was fascinated by what looked like a jack-in-the-pulpit with a long, black tongue instead of the jack *(Arisaema dracontium)*. Many, seeing the three leaves, think it is a jack. Having planted two or three of them 16 years ago, I have been trying ever since to get rid of it. The bulbs keep sinking deeper in the ground and multiplying if not dug up. Neighbors commented on "the wild parsley," which was really gout weed *(Aegopodium podagraria)*. After 20 years I have almost gotten rid of it by covering it with black plastic and piles of leaves. Whenever I see a plant I pull it up, with as much of the long, stringy, white root as possible. I was also taken in by that pretty little buttercup with a heart-shaped leaf that grows in masses along

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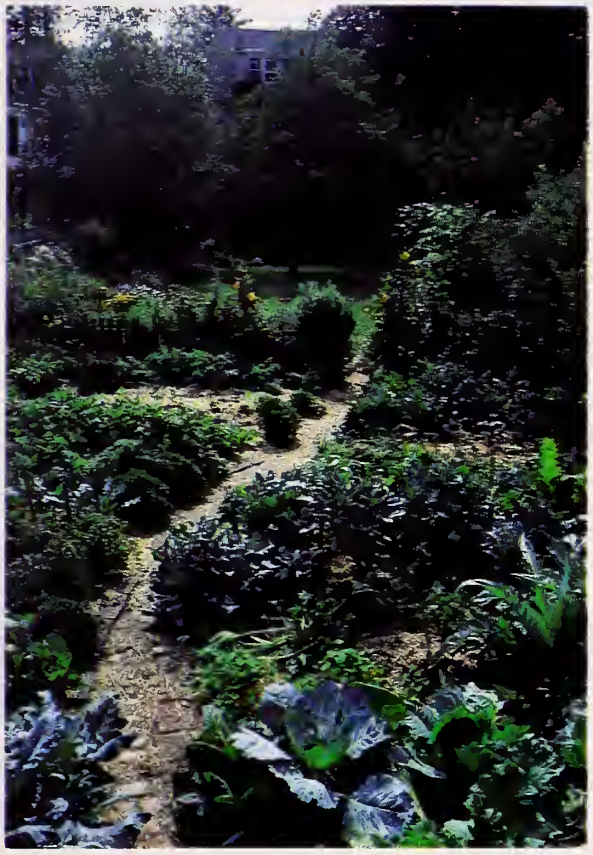


photos by Mary Lou Wolfe

◀
The author and Jane Pepper tour the gardens on a hot August day. The view is looking away from the author's house. The house at the center of the photo is an outbuilding and the greenhouse is just in front of it. To the left is the vegetable garden.

Squash grows up the outside walls of the greenhouse. (Photographed from inside)







The perennial border.

A small section of the vegetable garden.
◀


photo by Mary Lou Wolfe

the road, lesser celandine *(Ranunculus ficaria)*. It will love you as does the gout weed.

Then there has been the fun of trials that succeeded, as the slip of small-leafed euonymous, now espaliered on the wormy cypress fence along one side of the bricked yard, or the cutting from my grandmother's rose, now full-grown and adding a wonderful nostalgic fragrance to the garden. I bring home dead-looking plants from the stores after the holidays. Lilies, cut back and planted, will bloom the next year and sometimes sooner. Chrysanthemums, cut back and repotted after Christmas or Easter, will bloom in the garden in the fall. Slips have always been fun and a challenge. Although special media and Rootone improve my rate of success, many will root if they are planted in relatively soft earth and kept damp. I root pentas and scented geraniums in this way in the summer and bring cuttings into the house in the fall to save them for the following year.

the flower garden

Our wild flower area began with plants that didn't mind dampness or the shade, and could live next to privet. Ferns were perfect. Cinnamon, Christmas, interrupted, maidenhair, beech, fragile, ostrich, marginal woodfern, and male ferns all did well with little attention. Wood chips provided the acidity most of them want, and those we get free of charge from a dump maintained by the Philadelphia Electric Company. I have scattered pieces of limestone near a few of the ferns that like less acidity, such as the hart's tongue, polypody, and spleenwort. For variety I have added among the ferns plants with interesting or colorful foliage: lady's mantle *(Alchemilla vulgaris)* with its blue-green, ruffled leaves; globe flower *(Troillus* sp.) with its fern-like foliage and yellow buttercup flowers; white epimedium *(Epimedium* x *youngianem* 'Niveum') with its delicate foliage, in motion at the slightest breeze – it does not spread and is smaller than its sisters in red and yellow; pulmonaria *(P. angustifolia)* with its masses of blue and pink flowers and interesting spotted leaves – there are also varieties with yellow, white, and burnt orange flowers; columbine *(Aquilegia* spp.); bleeding heart *(Dicentra eximea);* a western variety of dogtooth violet *(Erythronium tuolumnense* 'Pagoda'); *Shortia* spp.; twin leaf *(Jeffersonia diphylla);* and anchusa *(A. myosotidiflora)* with its beautiful blue flower, very much like a forget-me-not and a favorite of mine. A discarded shower bottom has become a pool among the ferns, with a small waterfall courtesy of a circulating pump.

When we had corn, cucumbers and winter squash grew up the corn stalks. No space is left empty. A strip 10 in. long will serve to start some beets or beans that can be transplanted on a rainy, dull day to areas where crops have been harvested.

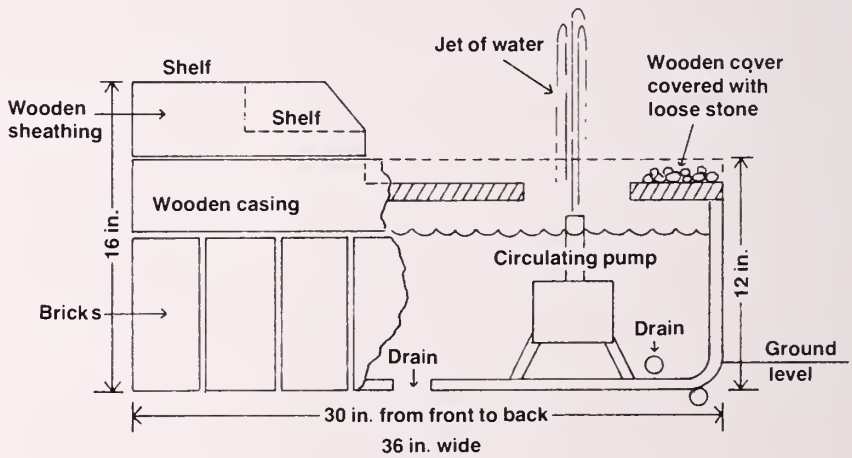
the borders

As the wild flower area was developing so too was the border along the other side of the lawn. Birch trees at one end of that bed again limited us to plants which would thrive in light shade, including English daisies, primroses, and pansies. I start all of these from seed in July, protect them in the winter, and in the spring they become beautiful plants with flowers in a pleasing range of colors. Along the rest of the bed I have tried for a variety of color and a continuous sequence of bloom from early March through October. The bulbs at the back of the garden come first, and I add to these in November or December when merchants are anxious to get rid of the last of their stock. I have found the bulbs do well if the earth is soft enough to work. I plant tulips at least 9 in. deep since they seem to last longer when planted at that depth.

Forward of the bulbs, in the sunny area beyond the birches, grow most of the more colorful annuals and perennials, like the Oriental poppies that follow the bulbs with a blaze of redness. After they have bloomed I brutally cut them down or pull them out, planting annuals in the bare areas, yet each year the red mass returns. Were I an iris grower they would be used to continue the color from the end of May into early June, but, alas, the borers are too smart for me. I have found, however, that the flags are distasteful to the borers, and with their mass of small blooms, add touches of white, purple, and yellow in those months.

Day lilies grow toward the back and

SITZ TUB AS RESERVOIR FOR FOUNDATION/PLANT STAND



There are two overlapping shelves wedged between the two sides at the back, one above the other, and at a lower level a wooden cover with a hole large enough to accommodate the jet and let the water fall back into the pool from which it came. The rest of the cover is covered with crushed stone. The wooden casing is supported by bricks on three sides.

among the bulbs, different varieties blooming from June almost into September. No bugs, no care, only separating every few years as the clumps get too big, and this is done savagely with a spade. Other lilies planted among these add variety and fragrance.

In front of the lilies are others of my old friends and new acquaintances, perennials and annuals, filling in all the color gaps for the summer. Some I have raised from seed, for example the pure white bleeding heart. Some are the result of happy exchanges with friends, an oxypetalum for a salpiglossis, a yellow flax *(Linum flaxum)* for a white *(L. perenne* 'Alba'), or a dwarf hollyhock for a dwarf coreopsis. Blue, pink, and white veronica make good accents and blend happily with red beesbalm, pink yarrow, and shasta daisies. California poppies, early shasta and red geum make a showy combination. Heliopsis and coronation gold yarrow are bright background plants. Phlox tints the garden in August. Asters and dahlias come in September. During the winter I store the dahlia tubers in the cellar in drawers from old refrigerators filled with peat kept slightly damp. Separating them in the spring, I have all I can use. Among the low perennials at the front of the bed are pinks, inula, dwarf coreopsis, *Iris cristata,* bird's foot violet, and candytuft. Fall arrives with the chrysanthemum, bursts of bloom among the marigolds, petunia, and *Salvia pitcheri,* with its sky-blue flowers, and the Nippon daisy, which may not bloom until October.

vegetables outdoors and in greenhouses

By curving the bed of flowers across the yard we gained more room for that planting and made the shape of the whole more interesting. Behind this curve and a low wooden fence is our vegetable garden. To compensate for limited space no vegetable is allowed the luxury of lying down, but must take the vertical course if it can. Winter squash climbs over the greenhouse. Cantaloupe planted in the cinder blocks that form the back of our cold frame grow up fencing there. Luffa sponges have their own wire netting. Peas, beans, and tomatoes all climb, and when we had corn, cucumbers and winter squash grew up the corn stalks. No space is left empty. A strip 10 in. long will serve to start some beets or beans that can be transplanted on a rainy, dull day to areas where crops have been harvested.

We have also had success with grapes. The vines grow on wires strung from the second to the third floor over the kitchen roof, air conditioning the kitchen. They produced 40 pounds of grapes last year.

Extending the growing season is another way of using space effectively. We have built a greenhouse with a discarded 8 ft. x 10 ft. metal window as a top; the sides are made of wooden storm windows sent our way by friends. Our cold frame is the width and breadth of three such windows, with its sides and back insulated by raised beds. Vegetables can be started in the greenhouse or the cold frame from 4 to 6 weeks before they can be started in the garden, and plants started under lights in the cellar can be hardened in one or the other for early planting. During the winter they shelter biennials, tender perennials, and various cuttings, as well as lettuce, spinach and swiss chard planted in the fall and harvested in the spring. We also use a number of mini-greehouses throughout the garden. A clear plastic cake cover is great for squash. Plastic gallon jugs with their bottoms removed protect young pepper plants. Glass or plastic covers from fluorescent lights serve admirably in starting beans or beets. Two glass windows hinged together make fine portable tentlike protectors. Sometimes just a piece of plastic held down by rocks over an area of delicate plants gives enough protection. I raise my herbs, about 20 varieties, in a series of concentric tiers, and cover them for the winter with straw and a circle of plastic. Only lemon verbena, dentate lavender, cuminum, pineapple sage, and basil need more protection, and these I move into the house.

As for tomatoes, I start them rather early, in February, under lights in the cellar. As they grow I put them in larger and larger pots, covering more and more of the stems. I set them out the first of May, always in the same area where we have erected a wire fence 30 ft. long by 8 ft. high. To minimize disease we change

continued

POOL WITH TRICKLE (WATERFALL)

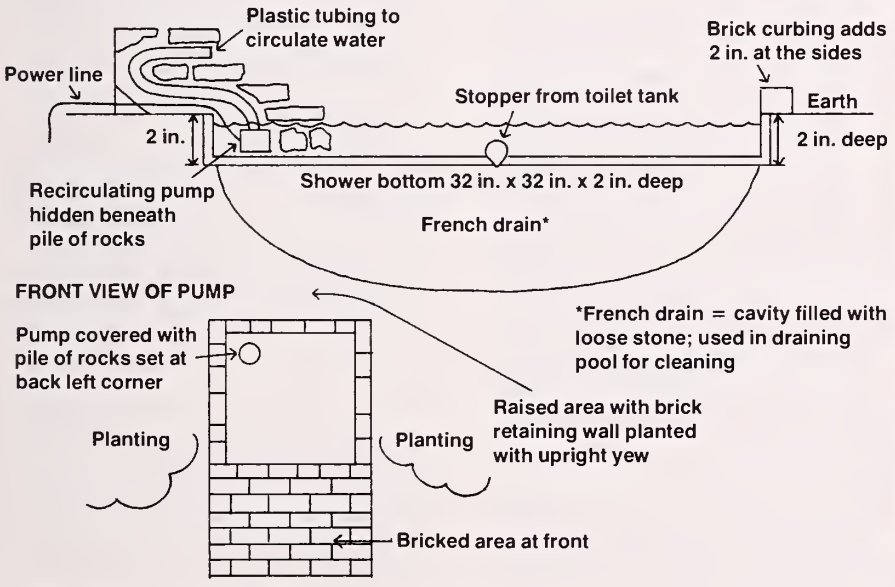




photo by Harriet B. Heaney

Devil drinks at a pool made from a discarded shower bottom.

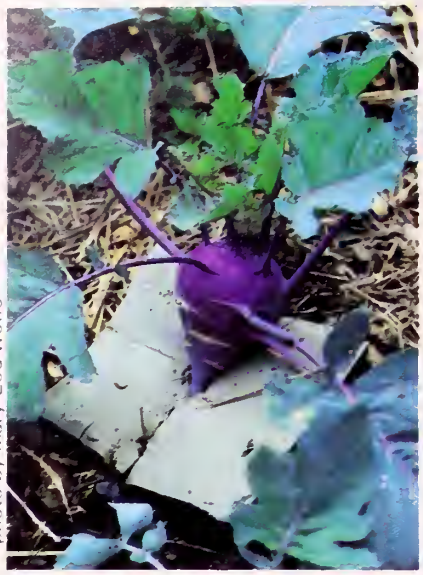


photo by Mary Lou Wolfe

Rutabaga is set on a square of plastic to protect it from pests.

the soil in this area from year to year, replacing the soil with compost. Knowing how sensitive tomato plants are to cold we have evolved our own technique for their protection. In the fall we collect bags of leaves from the neighborhood. During the winter we use these bagged leaves as windbreakers to protect our azaleas and other shrubs. Early in the spring we put the same bags behind our tomato fence since the black plastic will absorb heat and the bags will protect the young plants from the north wind. At the south end we add a series of small storm windows, leaning against the fence and slanted over the plants, stopping either end of the range with the leaf-filled plastic bags. The greatest problem with this scheme has been keeping the plants watered, but as a reward for the work involved, last year I had a tomato by July 1. I also use the space between the tomato plants as a place to start root vegetables and members of the cabbage family.

Storm windows and bags of leaves are not the only prizes to be found on trash nights. Old pipe and discarded mops and brooms have kept us in garden stakes for years, and popsickle sticks serve us as plant markers. The paths in the vegetable garden are made of brick, a windfall from a community garden that was to be replaced by a garage. There we collected not only brick, but also wood to make raised beds, marvelous mushroom soil, and some giant larkspur that refused to be stopped by building progress. Indeed, if you hear someone say, "Oh, they'll take anything," they are probably referring to the Heaneys.

small fruit

No kitchen garden is complete without small fruit. Fortunately for us, soon after we settled in, a neighbor wanted to get rid of ten well-grown blueberry bushes and threw them our way. As they tolerate some shade and will live near privet we extended the wild flower area on the south side of the yard with them. Everyone should have blueberries. You don't have to bend over to pick the cultivated variety; no bugs, no fertilizer (just wood chips and oak leaves), hardly any pruning, tasty berries with lots of vitamin C, and bright red foliage. The only problem is the birds, who also appreciate these gems. Netting, on supports that once displayed panels of wallboard in a hardware store, has solved that problem, along with our cat who loves to sit among the oak leaves and watch the birds. One year we picked 92 pints of berries. We ate them, froze them, canned them, made blueberry jelly, blueberry wine, blueberry buckle, and blueberry sauce. We have also had success with grapes. The vines grow on wires strung from the second to the third floor over the kitchen roof, air conditioning the kitchen. They produced 40 pounds of grapes last year. We have a small patch of raspberries, and strawberries grow at the back of our cold frame in a raised bed made from the corrugatd metal surround of a child's swimming pool. We also have, in the manner of the Ark, a pair of cherries, plums, peaches, pears and apples, but unfortunately the squirrels take what we consider more than their share of the fruit.

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pests

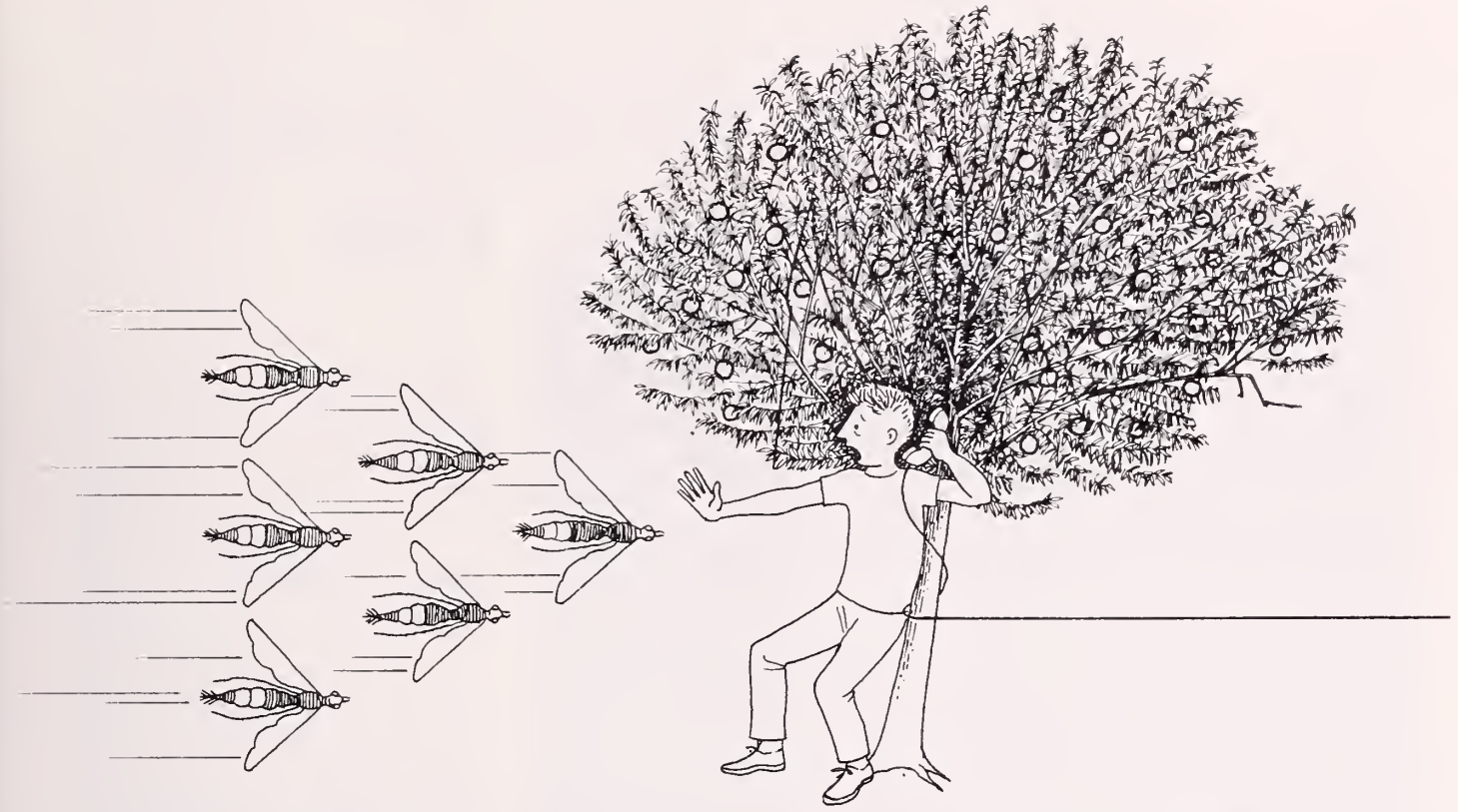
It is important to deal with other pests. I manually squash bean beetles, their eggs and larvae. I drown hundreds of slugs, Japanese beetles and asparagus beetles, and I catch many cabbage butterflies by net. I try to create unpleasant environs for intruders: tin cans without ends become barriers against cutworms. Squares of sponge with a slit fit snugly around the stems of the cabbage family to prevent certain flies from laying their eggs near the base of these plants (see photo). Sowbugs and slugs found the under side of the sponges a comfortable place to congregate, but a circle of fertilizer discouraged this kind of socializing. When the slugs attempted to crawl over the sponges I put a circle of salt on the upper side, knowing that a slug's body would be destroyed it if came in contact with the salt. Fortunately the salt does not soak through the sponge in sufficient quantity to affect the plant. When I harvest my onions early in July I scatter the tops among the rows of vegetables, believing them to be a deterrent to pests. You don't see bugs on onions. This is true of herbs, too, so I scatter cuttings from them in the same way.

Our war against weeds has been simplified by heavy mulching and by our good luck in having neighbors a few blocks away who keep goats and who put out in the trash every week from four to six large bags of straw bedding laced with goat manure. This, spread between the rows after the vegetables have gotten a start, keeps down all but the hardiest weeds, adds nourishment to the soil, and keeps in moisture as well. In the fall we rake back the top layer of the mulch, dig in the partially rotted layer, and then re-spread the upper layer. In the spring we carry the straw to storage between the tomato wire and the hedge, and spread it again when the soil has warmed and the vegetables are well started.

There has been a good deal of work in all of this, but creating our garden and producing our own fruit and vegetables have been a source of great joy to us. Indeed, as the line from A. Bronson Alcott carved on the panel of our garden bench puts it, "Who loves a garden still his Eden keeps."

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Harriet Benedict Heaney graduated from Mt. Holyoke College and the Columbia Presbyterian School of nursing. Most of her knowledge comes from a family that loves gardening, from a few botany courses and from much reading. She says she does a lot of freezing, canning and some drying. She has been successful with rose-hip, zucchini, blueberry and cherry wine.



WHAT DO YOU SAY TO A FRIEND WHO'S AFFLICTED BY PEACH BORERS?

by Allen Lacy

Every gardener who likes to be thought expert in the craft needs a friend like my friend Joe Walsh. Once a priest, he's now a family man with a house and a garden, which like most gardens offers its share of vexations as well as pleasures. Joe knows I envy him the enormous fig tree in his back yard not far from my own home in coastal New Jersey. It survives every winter without dying back, though he gives it none of the recommended protections. It bears a magnificent crop of luscious fruit every August. I've tried wrapping my own fig tree some years, as the books suggest, and I've tried leaving it to the elements, as Joe does, but the result is always the same: disappointment. It dies back to the ground in winter, sulks until early June, and then bursts into luxuriant growth, producing only a few small fruits which are blasted by the first killing frost before they ripen.

But despite the evidence of our two fig trees, Joe believes I know a great deal about gardening, so he turns to me whenever something in his yard seems utterly doomed. Today it was his peach tree.

The phone rang and it was Joe's voice saying, "Allen, my peach tree may be dying."

When I commented that peach trees were often short-lived, he groaned. To distract him I asked specifically what the problem was.

"Orange gunk," he replied. "There's a lot of sticky orange gunk dribbling from the trunk near the ground. And holes. I can see some holes."

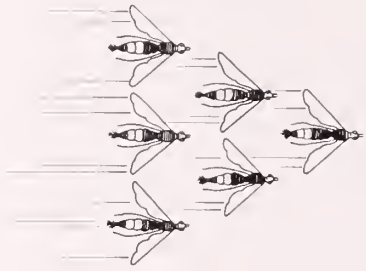
"Hmmm," I mumbled, suggesting that I was pondering the matter. Meanwhile I had grabbed one of those handy-dandy, fully-illustrated, complete garden guides that most book stores carry, usually on the remainder table of publisher's overstocks. This particular one I privately call "The Pessimist's Garden Book," because of its relentless attention to anything catastrophic that can overtake plants.

After a slight pause while I checked the index and read the page devoted to the woes of peaches, I was able to tell him that the chances were very strong that his tree was suffering damage from the voracious larvae of the peach borer *(Aegeria exitiosa),* that he should kill as many as possible by inserting thin, flexible wire into their tunnels, clean out the wounded areas with cotton swabs, and then spray the trunk with carbaryl or lindane immediately and then again in three weeks. Next fall he should dig in some moth balls around the tree to kill any eggs laid by the adult moths as they hatched.

"Then my peach tree will live?" he asked.

"We can't be absolutely sure," I said,

continued



"but we have a chance, if we follow the treatment scientifically."

I felt a warm glow after he hung up, probably to rush out for swabs and carbaryl or lindane. A friend with faith in my knowledge had consulted me, and I had given him judicious-sounding advice. I felt for a moment that I was the Michael DeBakey of the fruit tree world. The fact is, however, that I've never seen a peach borer in my life. If I did have a peach tree in my own garden (I don't) and found orange gunk oozing from its trunk, I wouldn't go to that book on my shelf. Instead, I'd place an immediate long-distance call to a friend in Boston and ask his advice. He *really* knows almost all there is to know about the science of gardening.

Thinking over this encounter, I felt a bit shabby and foolish: shabby because I had pretended to a wisdom I did not own, not even mentioning to Joe that my advice came straight from the pages of "The Pessimist's Garden Book"; foolish because Joe might not have borers at all, since there might be dozens of things that might cause orange gunk and holes.

But I also felt comfortably human. It's flattering to have a friend asking for advice about the solution to his problems, whether they be horticultural, marital, or financial. And it's comforting to think that every problem has its solution, if only we can find the right scientific expert.

But gardening teaches another lesson about problems and solutions. To a certain extent, horticulture is a science based on very few and simple assumptions – that every effect has its cause; that if the cause is known the effect may be altered; that observation of regular patterns in nature, deftness in framing hypotheses of explanation, and patient experimentation may lead to remedies that will keep borers from devastating the peach tree, crab grass from sprouting in lawn and garden, and onion maggots from getting all the onions. There may even be some rational way to make my fig tree bear. For the scientific gardener there may be things we don't know as yet, but there are no mysteries, only problems to work on with good cheer and pluck.

I admire those who approach gardening scientifically. I have learned many beneficial things from them. But I also know that gardening is an art and that as an art it has its mysteries, its inexplicable transactions between humans and everything else on the earth we inhabit. A garden is a living place where strange and sometimes unnameable forces meet and intersect, where outcomes are often unpredictable. It is a place where we are surprised and taken unawares by sudden disappointments – and by equally sudden delight.

Science refuses to attribute will to anything in nature, except human beings. I take a different view. The world is a personal place, with foes and friends. My crabgrass is out to get me. My tomato plants appreciate the care I give them and say thanks with bright red fruit. My fig tree has doubts, probably valid ones, about my worthiness of character.

Though I sometimes allow myself to play the scientific expert to friends like Joe, deep in the marrow of my bones I'm a hopeless mystic who is often overome by a sense of nameless wonder in my garden – over the beauty of a stand of pink and white Oriental hybrid lilies in August when they are suddenly lit by the last golden light of the afternoon, over the unexpected sickening and death of a tree I loved and thought would long outlast me, over the sense of evil that I feel at the mindless voracity of gypsy moth caterpillars.

Science, although it is the activity of persons who individually can never achieve a fraction of the objectivity they pretend, works because it is a collective endeavor that strives to exclude everything personal. It operates by refusing to admit purpose in the matters it studies, because it tries to understand processes in the simple faith that they must finally be capable of being understood, and because it refuses to attribute will to anything in nature, except for human beings.

I take a different view. The world is a personal place, with foes and friends. My crabgrass is out to get me. My tomato plants appreciate the care I give them and say thanks with bright red fruit. My fig tree has doubts, probably valid ones, about my worthiness of character.

At night, I suspect, elves gather underneath the shrub roses out front. When my old swamp maple turns crimson in the fall, it may be partly a matter of seasonal rhythms, hormones and sugars, genetic programming, and changes in light and temperature. But old Jack Frost is also there, touching them with his wand, urging them to flame forth in a final spectacular burst of color for human delight before it's time to settle into the sleep that maples sleep all winter when the earth lives beneath its comforting blanket of snow.

Science tells us what to do about borers, but it doesn't offer the final word. Gardening involves the feelings and the affections we have for things, not just the techniques we have learned, the information we happen to know. Gardening is my friend Joe Walsh, loving his peach tree, asking advice from others, and then tending its wounds with cotton swabs and strong medicines for its ailments while hoping that it will live for many more seasons.

●

Allen Lacy teaches philosophy at Stockton State College in Pomona, New Jersey, writes literary criticism for several metropolitan newspapers, and has written on gardening for the *Wall Street Journal*, *New York Times*, and *Horticulture*. He is the editor of a forthcoming volume, part of Princeton University's series of collected work of Miguel De Unamuno in English translation.

GLASS FLOWER ART

by Lauralou Courtney Bates



photos by Mary O'Hara Gregory

The author in her studio. Lauralou Bates uses the financial pages as a backing for ready-made alignment. Here she is framing glass pressed flowers.

After working years in the clothing and textile business, I began to explore other paths of creative fulfillment. It was then that I came across a pressed flower course given by Katie King at PHS.

The first course with Katie King was given in the fall. I loved the flowers I had arranged from the ample King supply, and I wanted them mounted in glass. It would have been much easier to just place my original pressed flower creation on cardboard and frame it; but that was not for me.

I could not find help to mount my original flower arrangement in glass. I carried the arrangement around with me for months searching for a solution. Finally I found a glass artist who consented to do it. Although it was beautiful when finished I was not present at the mounting and dust and fingerprints were mounted along with my creation. So I had to surmount that problem also. Undismayed, I set about doing a group collection as I had in clothing and fabric design. My new glass contact cut the glass pieces to specification and now I needed more pressed flowers. Back to Katie King's class and her ample supply two more times to complete my projects (winter and early spring).

Spring flowers started to bloom and I bought a small press. One was not enough. I bought another. This was soon filled, too, and emptied many times to store the collected specimens. I had two more presses constructed the full size of a newspaper sheet. I was really into pressing now.

Problems arose. My glass contact refused to do any more leading. It was considered "non-creative." I was dismayed.

I began another search. I contacted many other glass workers until I found a stained glass firm and begged them to apprentice me for a week. (The fruit of that apprenticeship was hung in Christ Church sanctuary in the north window – a cross made of flowers from Christ Church garden.) How proud I was.

So began my labor of love of flowers

continued

This piece can be worn or hung at a window or other light source. It consists of green hand-slumped textured glass with flower petals of hand-slumped crystal glass leaded using the Tiffany technique. The center is a hand-blown rondel cut from a cylinder with baroque squiggles of copper wires leaded as an overlay and to secure the flower.

A necklace of hydrangea flowers enclosed in two pieces of window glass wrapped with adhesived copper foil tape and leaded via the Tiffany technique: fluxed and soldered. The chains, neckring and silver balls and plate are from jewelry supply sources.







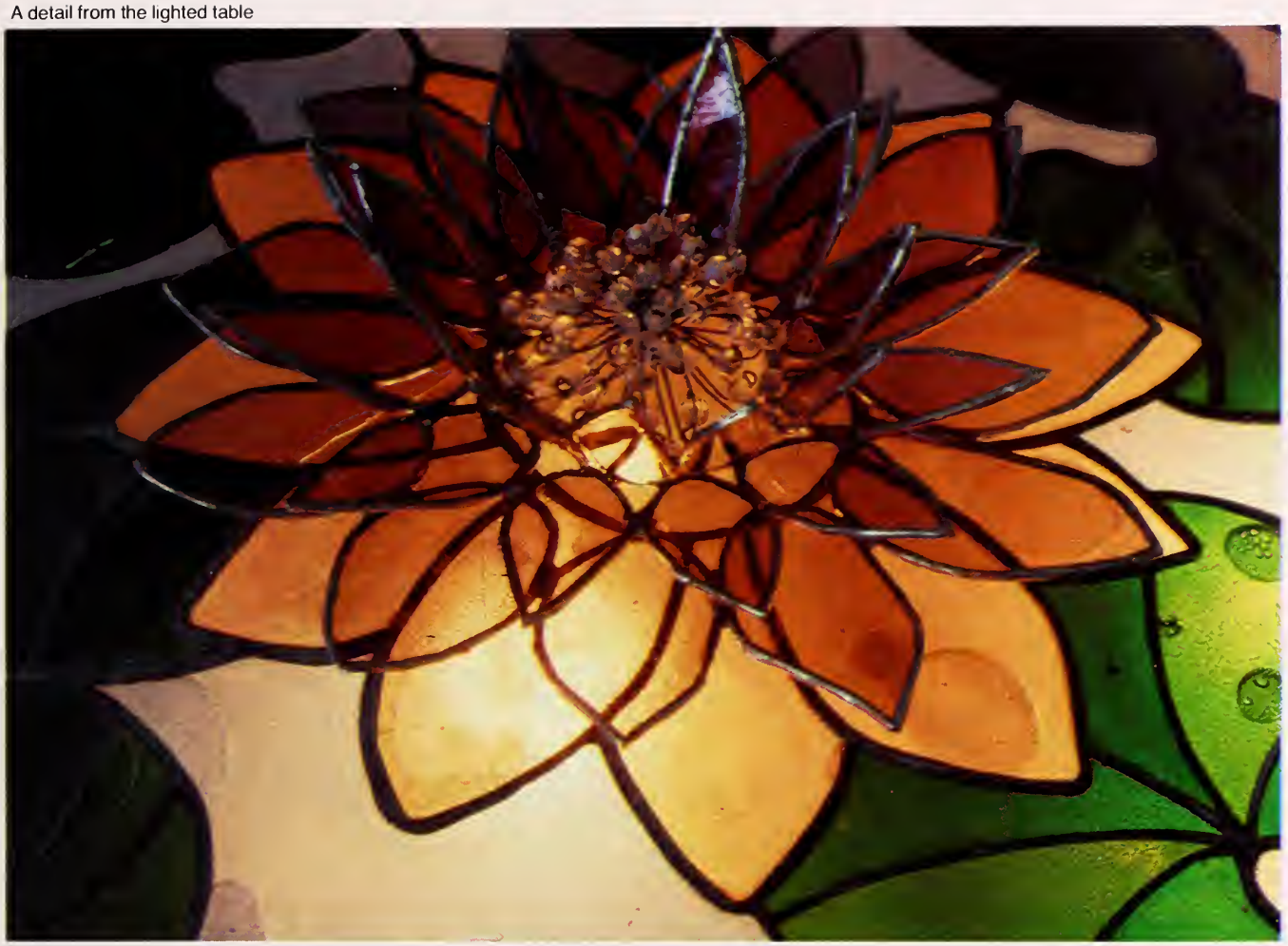
A chatelaine of antique glass, found pieces from old gardens, Austrian hand-carved crystal, dimensional irridescent slumped (almost melted and annealed) pieces and hand-blown goblets. You can see the flower signature of a pink pressed hydrangea to the left of the Austrian hand-cut crystal oak-leaf pendant.

in glass. Everywhere I went I took scissors, plastic bags and telephone books to collect specimens and press them while on location. I visited my friends and collected. I visited my children and collected. I went abroad and collected. I filled all of my presses with all kinds of growing things from places all over the world. I pressed anything that I wished to preserve. The joy of really seeing the natural beauty of these materials and preserving them heightened my energies. I developed a philosophy for my work: natural materials in a natural light medium of pale tones to let daytime light patterns shine through.

Now I began to create pressed flower art in glass in earnest in my own studio. To create a pressed flower collage I found that I needed a great many specimens in perfect condition because of the fragility of the material. So it has taken several years to compile this collection and, of necessity, it must be an on-going activity.

So my evolution came from a single

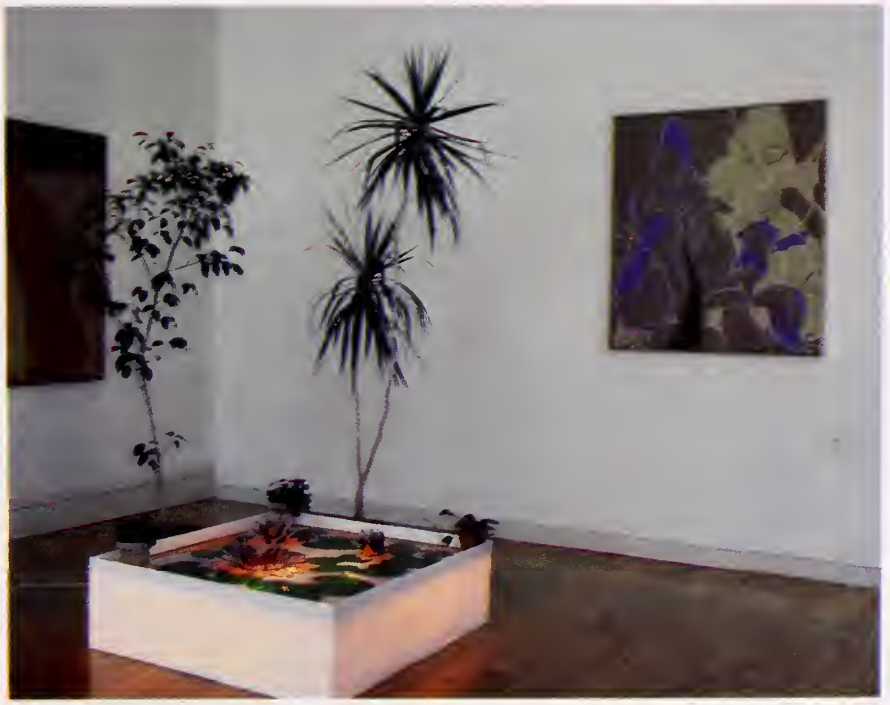
A detail from the lighted table



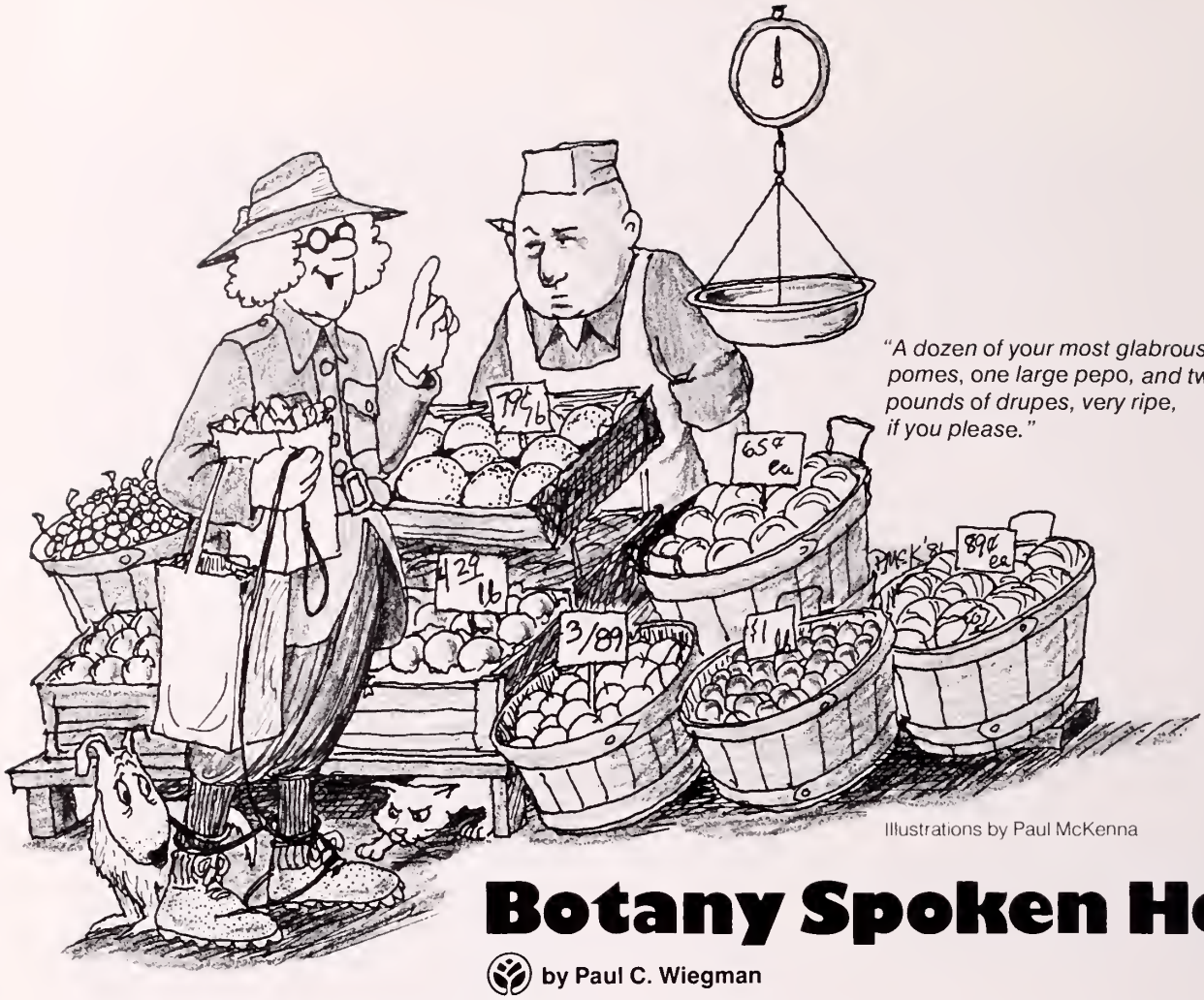
arrangement of pressed flowers in glass to a cross flower arrangement in Christ Church sanctuary; gifts of flower arrangements in glass for friends; wedding bouquets; anniversary arrangements; a window for the opening of the Costume Wing, Philadelphia Museum of Art; wearable glass art; a pool of glass with water lilies in dimension after Monet; glass garden sculpture of children picking flowers with real pressed flowers laminated in the sculpture; and now, scenes in glass all with pressed flowers.

●

Lauralou Bates has exhibited her pressed flowers in glass extensively on the east and west coasts of the United States, as well as at the World Crafts Meeting in Vienna, Austria. Her work hangs in Glassmaster's Gallery in New York, Moderne Glaskunst Galerie, Wolfburg, West Germany, and at the Art Alliance in Philadelphia. She is an active PHS Life Member, exhibiting in the Flower Show and assisting in the 18th Century Garden.



"After Monet's Water Lilies" – a lighted pool on a dimmer; to hold one inch of water; shown full size in a gallery. The flowers are made of English antique hand-rolled glass with stamens and pistils of Austrian crystals and copper wire leaded.



"A dozen of your most glabrous pomes, one large pepo, and two pounds of drupes, very ripe, if you please."

Illustrations by Paul McKenna

Botany Spoken Here

by Paul C. Wiegman

I was at a party recently and joined an interesting conversation around a large container of fresh fruit. What better setting for a naturalist than next to a bowl of natural bounty. One fellow was discussing the virtues of peaches, but because of their skin, said they must be peeled before eaten. He particularly didn't like that scaly feeling he would get in his mouth when eating unpeeled peaches.

Quick on my feet, and always ready to bring botanical knowledge into everyone's life, I noted that actually the skin, better called the "exocarp," of the peach was not at all scaly, but covered with minute hairs. The best term to describe this interesting and protective covering was "tomentose." The people around the fruit bowl quieted.

Taking the opportunity of the group's obvious interest, I went on to explain that to be precise one might even call the surface "velvety," or maybe "lanate" or even "floccose," but definitely not scaly. Nobody spoke.

I continued to explain that botanists are very precise. Just to describe something as simple as the hairiness of leaves, botanists require 29 terms, not counting the 10 or 12 that are synonymous. Each term describes a particular degree, or arrangement of hairs on the leaf surface. Some of these terms are vividly evocative. Imagine a "mealy," or "villous," or even "hispid" surface. Words to send chills down the spine of the fellow that didn't like the scaly feeling.

Just then the wine tray passed and I grabbed a glass to illustrate the fermented juice of a "berry."

My monologue was broken when someone quickly injected that they didn't have to worry because they were allergic to fruit, and furthermore, the thought of a mealy peach was disgusting.

Not wanting to get away from a good conversational topic, I quickly pointed out that she probably wasn't allergic to all fruit, because botanically fruit is a broad and commonly misused word. To be correct, she is probably allergic to some specific group of fruits. The botanist defines a "fruit" as a ripened ovary, its contents, and any attached floral parts. Other features divide fruits into groups such as acorns, apples, rose hips, maple seeds, and pinecones.

The fruit bowl was a perfect illustration. As I rooted through the assorted collection of ripened plant ovaries I found a number of show-and-tell examples. "Look, this apple is actually a 'pome'." Just then the wine tray passed and I grabbed a glass to illustrate the fermented juice of a "berry."

"Tomatoes aren't vegetables, they are also *berries.* On the other hand, a raspberry is not a berry but an 'aggregate'." That's a little fleshy ball made of several fruits.

Strawberries are really quite unusual as they grow from one flower, and are called an "accessory." Roses always grow "hips." A pineapple is a "multiple." Squash, still a fruit, is actually a "pepo." Back to our peach. "It's a 'drupe'."

By now my audience began to evaporate. At the same time my wife came to break into the group. She led me away, mumbling about getting me dressed up, but not being able to take me out.

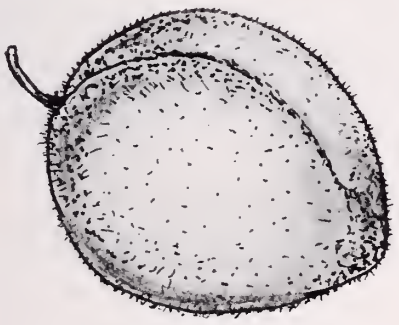
Nevertheless, the conversation gave me the idea to do an article about botanical terminology. At times difficult to

Reprinted courtesy of *The Pennsylvania Naturalist*

remember, often difficult to pronounce, but always precise, the jargon of the botanist is essential language if you plan to positively identify the plants you see. And with spring upon the landscape, a new season of flower finding beginning, what better time to learn to use the language of botany.

One aspect of botanical jargon doesn't change–even the seemingly simplest feature will be described in an inordinate number of ways. For instance, a leaf has three parts: petiole–the stalk, blade–the expanded portion, and stipules–a pair of appendages where the petiole joins the stem. Simple enough, but consider this. First there are 13 ways leaves can be arranged on the stem. "Opposite," "whorled," and "alternate" are commonly known arrangements.

Now the leaf blade can be "lobed," "cleft," "divided," or "parted," for single



a drupe

leaves, and there are eight more arrangements for compound leaves. Overall shape of leaves is described with 22 terms. Add to that leaf margins, which have 15 terms; veins, in 5 patterns; leaf ends or apices, 13 styles; leaf bases with 14 terms, and surfaces defined in 16 ways with another 29 degrees of just being hairy. Then add to that the terms related to flowers, stems, roots, and other parts of the plant and you have a huge array of sometimes bewildering terminology.

there's hope

But don't be dismayed. There is good reason for all these words. Without the precision of botanical terminology taxonomists could not sort out and accurately describe the numerous species. For you, making positive identifications is increased if you know and use botanical terms. How do you learn botanical terms? Simply through use. They are like a foreign language. The more you use it, the more fluent you become.

creating your own manual

To help you learn the language, most good botanical texts, field guides, and other references have glossaries. Over



a pome

the years I've copied these and glued small sections to the pages of a 7 in. x 4 in. looseleaf binder. Along with that, I've included illustrations such as leaf edges, hair arrangement, flower types, and other botanical information. All of the pages go into a binder and it becomes my own personal field book. Also included in the notebook is a page with collecting methods, characters to look for, and information to collect when working with an unidentified species. You might want to include other information such as animal tracks, diagrams, photography data, map scales, or anything else that you personally use in the field.

To find the glossaries, check the field guides you have. Look inside the front and back covers of Peterson's *Field Guide to Wildflowers* and you'll find a pictorial glossary of botanical terms. The introductin of the *Field Guide* also has a two page glossary from achene to wing. More detailed texts have more detailed glossaries. *Gray's Manual of Botany,* by M. L. Fernald, published by Hafner Press in New York, contains a 17 page (abaxial to zygomorphic) glossary at the end of the text. A favorite of mine is a book entitled *Vascular Plant Families,* by James Payne Smith, Jr., published by Mad River Press, Inc., Route 1, Box 151-B, Eureka, California 95501. The book has, among other things, an illustrated general glossary, as well as descriptions of all native North American plant families. It's 320 pages, in nearly



a berry

field guide proportions, packed with botanical information to help you identify plants in the field. You may also find some interesting words to include at your next party.

"Would you pass that bowl of pomes, drupes, berries, and hesperidiums, please?"

●

Paul G. Wiegman is naturalist-at-large for The Western Pennsylvania Conservancy.

Do you have a question or comment concerning botany? Paul Wiegman will be happy to answer any inquiries directed to him at 316 Fourth St., Pittsburgh, PA 15222.



photos by Nancy A. Sierens

Cedar rafters (2x8) are convenient for hanging baskets. Note pop-in shutters stacked against stone wall.

Rigid board insulating shutters pop in at night to prevent heat loss.



Brick floor, stone wall of adjacent structure and stuccoed brick wall of existing townhouse all provide mass to hold the heat of the day.



GROWING SOLAR

by Nancy A. Sierens and William J. Collins

If you have a small area exposed to the winter sun, you can produce fresh vegetables all year long in a solar growing structure.

A solar growing structure differs from conventional growing structures: greenhouses, cold frames, hotbeds and cloches. These typically overheat during the day and lose heat during the night. Solar structures collect and store the winter sun's heat to release to plants during the night, when it's most needed. Solar growing structures can be successfully operated with no backup heat system.

Solar structures can be custom designed or bought ready-made; freestanding or attached to an existing south wall; large enough to extend living space or as small as a bay window.

We've addressed here our experiences with solar greenhouse design and operation including our winter food production trials at our Germantown office greenhouse.

THE STRUCTURE

maximize available light

Orient the structure's glazing (transparent or translucent material) as near to a direct southern exposure as possible. Within 5° east or west of south is optimal, but as much as 45° is acceptable. Our office greenhouse is nearly 45° off south and barely receives six hours of light in December and January through its south and west facades. Even so, many crops have successfully grown.

Tilt the angle of the glazing to within 15° of your geographic latitude. In Philadelphia 25° to 55° maximizes the amount of light received.

Paint the solid north, east and west interior walls white to reflect light. The additional warmth that might be retained from black, heat-absorbing walls is not as significant for growing as is the light gained with reflective surfaces.

The various glazing materials (glass, fiberglass, acrylic, polyethylene) have similar light transmission qualities. Double glazing is standard in this area. We chose clear glass for our office greenhouse, but if the view is poor, translucent glazing may be preferable.

collect and retain the sun's heat

The capacity to collect and retain the sun's heat (without overheating) differentiates a solar growing structure from a conventional growing structure.

Conventional growing structures with no supplemental heat source for nighttime insulation can fluctuate from below 0° to over 100°F in winter. Since most vegetables find a daily temperature fluctuation of 15°F optimum, the design of thermal storage and insulating systems is critical.

Adequate thermal mass in the form of masonry walls or floors, stored water, soil or phase change materials will absorb the sun's heat and slowly release it when needed at night. Thus, mass narrows the daily temperature fluctuations. One to two gallons of water or one cubic foot of masonry per square foot glazing area is generally adequate thermal storage. Locate the mass close to the growing area to optimize the nighttime heat transfer.

We plant tomatoes again in January, when light levels have increased, and expect 10 to 20 lbs. of fruit per plant by springtime.

Movable insulating shades, shutters or curtains, placed inside the glazing at night, will prevent stored heat from reradiating to the outside. Some movable insulation is commercially available, but the field is new. We are currently devising designs and production plans for these. Often custom designed systems are required. Our office greenhouse uses a combination of pop-in rigid board shutters and a roll-down reflective curtain, both custom made. With the pop-in shutters between the rafters, we can attach hanging plants to the structure. The curtain rolls below the rafters, sacrificing the opportunity to hang plants from them. This loss in growing space is traded for the convenience of operating daily one large curtain.

provide adequate air exchange

In winter months humidity caused by plant transpiration (in attached units) can help moisten dry house air. However, condensation encourages fungal growth and can eventually rot sills and benches unless you take precautions to adequately drain water and keep air moving.

Vents to the exterior should approximate 1/6th of the total floor area. Optimum cross ventilation is provided by placing the inlet low on the windward side and the outlet high on the leeward side. A relatively large ratio of outlet to inlet size creates the speediest, hence most cooling, air flow. These vents are in addition to apertures between living units and attached solar structures.

If the thermal mass is calculated and positioned correctly, exterior venting will seldom be necessary during the winter months. Our office greenhouse is rarely vented to the exterior and constantly vented in summer. Our attached structure design allows for excessive winter heat to be stored in masonry walls and floors, and transferred by convection to other parts of the office. A microfan (100 cfm) assists in this function. Ceiling fans are also beneficial to air motion and to lower stratified warm air.

provide electric and water connections

A convenient source of fresh water is essential. Ambitious people can recycle greywater from household laundry and showers, but periodic fresh water leaching of salts from the soil is required. Locate the water faucet in a convenient spot away from electric outlets and with room for hose storage.

Portions of warmed, thermal mass, water can be used for irrigation early on sunny days (see water section in this article for details). Containers can then be refilled to gain and store the day's solar heat.

The sun's energy can be supplemented with electric lights and/or heating cables. Convenient and safe outlet locations should be provided. We have found heating cables give more constant temperatures, preferred for seed germination, than the average temperature in greenhouses on a cool morning. Electric lights can hasten the germination period and seedling growth. However, with good structure orientation, this is generally not necessary.

take structural precautions

Solar greenhouse design should consider weights of materials and resulting size of structural supports, especially in rooftop retrofits.* Water weighs 8-1/3 pounds per gallon or 62-1/2 pounds per cubic foot. Wet soil and planters will be even more. Make certain any supporting structures will carry the design load. In addition, snow loads on the greenhouse roof must be taken into account, since insulating curtains will prevent heat loss and resultant snow melt.

THE CROPS

light

The greatest restriction on wintertime growing is available light. Any less than six hours per day causes legginess and poor flower and fruit set.

Subtle interior light variations will occur as the time of day, season of the year and local weather conditions change. We have found the growing bench against the north wall to be the

continued

*retrofits: rehabilitation of structure for energy conservation purposes.

brightest spot in winter, when the sun angle is low. It is perfectly suited for planting peas in mid-winter. In summer the same bench is totally shaded by the solid roof section and provides a cool spot for shade-loving ornamentals. The south bench section which received the earliest morning light and maximum hours of exposure is reserved for seedlings.

Even with total exposure to winter sun, certain crops are limited. The days are too short and the sun's rays are too weak for blossom set on tomatoes in December and January. Tomatoes planted between October and December would begin to develop blossoms in these periods of inadequate light. For winter tomato harvesting, we plant seeds in mid- to late summer. We plant again in January, when light levels have increased, and expect 10 to 20 lbs. of fruit per plant by springtime.

Most experiments demonstrate that root crops and greens are repeatedly successful mid-winter solar structure crops. Please refer to the planting schedule for a list of these.

warmth

Temperatures in properly designed and maintained solar greenhouses will range between 40° to 80°F. Just as various light conditions exist within the greenhouse, so do different thermal zones.

Warm soil stimulates and hastens plant development. Soil is a good thermal mass and will retain much heat, which can be supplemented with warm thermal storage irrigation water. We use heating cables only for seed germination to maintain a consistent 70° to 75°F.

Increasingly popular Oriental greens and cabbages flourish even with cool night temperatures. Tests have determined they are faster growing and more nutritious than Swiss chard or lettuce. Their yields substantially surpass that of spinach and Swiss chard in cool temperatures and winter light levels.

Not only are tomatoes sensitive about light, they are also sensitive about temperature. A steady 60° to 80°F is optimum. Below 55° blossoms will not set. Hanging baskets for tomatoes in the greenhouse peak, where warmer air stratifies, may make the difference in successful blossom set.

growing medium

Soil is the most common medium, and many mixes can be created. A soil mix should be light and friable, especially for good seed germination.

Good quality compost makes an excellent greenhouse growing medium. We have set aside a small area for composting kitchen and greenhouse vegetable scraps.

The following soil mixes have also worked well for us: one part topsoil, one part organic matter, one part sand; or one part topsoil, one part manure and two parts compost. Since the nutrients available in topsoil, manure and compost will vary considerably from one source to the next, soil testing is critical. The local agricultural extension service will test your soil to determine which nutrients need supplementing. Then you can add the nutrients required using organic (cottonseed, cornmeal, soy meal, rock phosphate, greensand, manure, etc.) or commercial fertilizers.

Soil should be in beds 18-24 in. deep for good root development. Beds in the floor may be preferred to raised growing benches.

Since water is one choice for thermal mass, hydroponic growing (in water with no soil) merits consideration as a growing medium for solar structures. Hydroponics requires regular fertilizing, carefully measured and precisely applied. Whereas soil will store nutrients and moisture for use as needed, a hydroponic growing medium requires constant monitoring. Being much less stable than soil, hydroponics is not for the amateur.

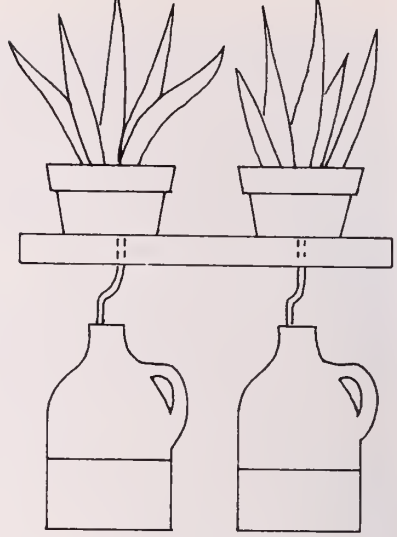
planting schedule and crop layout

The timing of your crops depends on available space, light, maintenance time, and estimated rate of consumption. In a precious, semi-tropical space surrounded by winter, every device possible should be used to maximize growing area.

We have used trellises for peas and beans. Pots of dwarf tomato varieties hang from the rafters. Planting beds are intercropped with root and aboveground vegetables.

Companion planting is a consideration in small growing spaces, yet it merits study as a method of pest control.* Try planting sage with carrots, radishes with beans, beets with cabbage. Marigolds, nasturtiums and many herbs all help to control pests and should be planted throughout the structure.

Crop rotation is as important in solar



Wick watering

growing structures as anywhere. If limited space and microclimates restrict rotation, change the soil instead. Most important, cole crop soil should be exchanged with enriched legume soil every season. See p. 30 for a planting schedule that will provide fresh produce year-round.

varieties

Seed catalogs are great mid-winter tempters. All the old faithful varieties and new exotics, glowingly portrayed in warm living color when all around is frozen and white, can make a gardener lose all good sense. Remember, space is limited.

Choose varieties for flavor first. Select short season crops to cope with limited light conditions, compact varieties to save space, and disease resistant varieties to save aggravation.

We have found the best selections, including Chinese greens and cabbages, to be available from these seed companies:

Johnny's Selected Seeds (50 cents), Albion, ME 04910
Herbst Brothers Seedsmen, Inc.(free), Brewster, MA 10509
Vermont Bean Seed Company (free), Bomoseen, VT 05732
George W. Park Seed Company (free), Greenwood, SC 29647 (dwarf and container varieties)

fertilizer

The young plant is adequately nourished by the seed for the first few weeks. The best time for the first fertilizer is when transplanting the seedling into its permanent bed. We use 15-50-15 diluted to half the recommended strength. As this may be difficult to find, 15-30-15 is adequate. We, however, prefer organ-

*See "Companion Planting in the Vegetable Garden" by Nancy P. Howard, *Green Scene,* July, 1981.



Spring seedlings in a New Jersey passive solar home by Resources Limited.

Several varieties of Chinese greens and cabbages are grown all winter at Rodale Organic Gardening and Farming Research Center, Emmaus, Pa.





The impatient gardener's early harvest in late February includes carrots, squash, lettuce and Daskon radish.

ics because they include trace elements essential to complete plant growth and our diets.

If liquid seaweed is available, try this mixture: one gallon of water, one T. bloodmeal, one T. liquid seaweed, one T. fish emulsion. Salt will build up with constant use and must be leached periodically with fresh water. We have used dilute (2:1) manure or compost teas. (Tea mix: one bushel to 55 gallons water).

water

Water conservation is as important as energy conservation. Our plans include a filtered greywater system using household waste water for irrigation. We have devised a wick irrigation system for some of our crops. Water is stored in plastic bottles below the north growing bench; it is drawn to the planting beds above using a cotton rope. With this conduit for moisture, the irrigation chore is automated and plants receive water as needed.

Without automation we find it necessary to water almost daily in summer. In spring and fall two to three times per week is adequate. If skies are cloudy and temperaures low, weekly winter watering is usually sufficient.

pest control plan

Solar greenhouses are plagued with fewer pests than conventional greenhouses. Most pests don't like the cool night temperatures, but some control measures may be needed.

As with fertilizers we prefer the biological approach over commercially available chemicals.

We find that companion planting, hand picking insects, and soapy water rinses keep unwanted pests under control. Rodale Press has reported success with the following experiments:

Cabbage loopers and cabbage worms – *Bacillus thuringiensis* (BT), catnip and tansy interplanting

Potato beetles – catnip and tansy interplanting

Slugs – mashed slugs diluted with warm water, sprayed on affected plants

continued

THE REWARDS

Our goal at the beginning of this project was to achieve a significant degree of food and energy self-sufficiency as quickly as possible. Being right in the city, our greenhouse is hampered by its orientation (nearly 45° off south) and limited available light (six hours/day maximum). As a result we've had some successes and some failures.

We got a late start last year (November) and decided to grow a wide variety of greens, root crops and tomatoes to see which would best withstand the adverse conditions. Our quantities were too small to provide all our winter vegetables, but we were able to gauge maturity dates and measure production, so we can predict quantities to expect this year. All of our crops grew leggy as they stretched for sunlight, and maturity dates were at the long end of the expected time periods. These are conditions we accept in our situation, but would vary with each particular greenhouse.

Our greatest success was with Oriental greens and cabbages, short season tomatoes and dwarf carrots, so we plan to repeat these and add some new trials. Four square feet of beds will be for greens, planted sequentially over the winter months. Three square feet each of carrots and onions will be started in the fall. In late winter we'll begin beans, peas, tomatoes, broccolli and squash.

As food and energy costs continue to escalate, and as we perfect our planting operations, our self-sufficiency and the value of our investment increase. Consider the savings in heat, energy, tax credits, appreciation of your property, the joy of fresh vegetables and semi-tropical weather all winter, and you may be in the market for growing solar.

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Nancy Sierens and William Collins are principals of Resources Limited, a Philadelphia and New Jersey based solar and landscape architectural design firm. Ms. Sierens received her BLA from the University of California and is a licensed landscape architect in New York and Maryland. She has been growing plants for 15 years, most recently specializing in solar greenhouse food production. Collins received his BS in landscape architecture from the University of Ohio and specializes in energy conscious development. His solar design and appropriate technology has received awards from the Department of Housing and Urban Development and the Department of Energy.

PLANTING SCHEDULE

Season	Greenhouse Crop	Approx. Days to Maturity*
Mid winter	Chinese cabbage	55-90
Dec. 15 - Feb. 1	Chinese greens	30-60
	Carrots	55-110
	Onions	95-100
	Radishes	20-70
Late winter	Chinese cabbage	55-90
Feb. 1 - March 15	Chinese greens	30-60
	Beets	55-65
	Carrots	55-110
	Onions	95-100
	Radishes	20-70
	Turnips	35-50
	Beans (pole/snap)	60-75
	Cole crops	55-90
	Cucurbits	45-110
	Lettuce	45-80
	Nightshade**	55-120
	Peas	65-85
	Spinach	40-50
	Swiss chard	40-50
	Herbs	85-90
	Chives	85-90
Spring	Beans (pole/snap)	60-75
March 15 - May 1	Cucurbits	45-110
	Nightshade**	55-120
	Herbs	85-90
	Annuals	
Early summer	Spring cleaning	
May 1 - June 15		
Mid-summer	Cole crops	55-90
June 15 - Aug. 1	Cucurbits	45-110
	Nightshade**	55-120
Late summer	Beans (pole/snap)	65-70
Aug. 1 - Sept. 15	Peas	65-85
	Herbs	85-90
Fall	Chinese cabbage	80-90
Sept. 15 - Nov. 1	Chinese greens	30-60
	Kale/Collards	55-70
	Carrots	55-110
	Onions	95-100
	Radishes	20-70
Early winter	Chinese cabbage	55-90
Nov. 1 - Dec. 15	Chinese greens	30-60
	Carrots	55-110
	Onions	95-100
	Radishes	20-70

*The number of days to maturity may vary with each greenhouse location and exposure. For beginners planning their first winter crops, we suggest using the longer days as a guide to maturity days.

**tomatoes, potatoes, peppers, eggplant

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Intensive Cultivation of Vegetables – French System. A. Aquatias. Solar Survival Press, Harrisville, PA.

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Movable Insulation. William K. Longdon. Rodale Press, Emmaus, PA.

The Solar Greenhouse Book. James C. McCullagh, Ed. Rodale Press, Emmaus, PA.

Solar Growing Frame. Ray Wolf, Ed. Rodale Press, Emmaus, PA.

Summary of Cool Weather Crops Tested 1979-80 for Solar Structures. Eileen Weinsteiger. Rodale Press, Emmaus, PA.



Giving Books for Christmas

by Mary Lou Wolfe

When I agonize over choosing exactly the right book for friend or family, I'm reminded of one I received when I was 14 years old. My father's Christmas present to me that year was a weighty tome, David Fairchild's *The World Was My Garden*. On the flyleaf he wrote "May you too discover the world of plants. Love from Dad at Christmas." I thought it was great to be considered old enough for such a book but at first I enjoyed it only for its photographs of odd plants, strangely dressed and undressed natives in exotic settings like those in *National Geographic*. The book was fat and heavy so I used it to press flowers, but it wasn't until years later that I enjoyed Fairchild's accounts of plant exploration. What my father really gave me was a vote of confidence. You may be guessing that I'm all in favor not only of giving books at Christmas but also of putting one's message there front and flyleaf. A book donated to the library book sale bore the inscription "Let's get our feet wet together," which sounded like great fun for the recipient of *Bog Trotting for Orchids*. On another, Homer House's *Wildflowers,* was penned the message "For Mom, who taught me to really see." She used it too, for there were pencilled notes in the back and a pressed violet among the pages.

My holiday message for gardening book givers this year is to consider some of the choices described here, order early and then enjoy the possibilities of penning a really personal message. All the books I've chosen have been published within the past few years, may be seen at the PHS Library, and can be ordered from your book dealer using the bibliographic information listed at the end of this article.

There are not many books that appeal to as wide a range of interests and expertise as does Hugh Johnson's *The Principles of Gardening*. He claims his inspiration came from *Down the Garden Path* by Beverley Nichols, who wrote "I know that unless I write a gardening book now it will be too late to write it at all. For shortly I shall know too much..." Johnson says he writes from his gardening viewpoint of seven or eight years ago and since he is editorial director of the *Garden Journal of the Royal Horticultural Society,* his vantage point is superb. This book can be enjoyed on a great many levels from its stunning, plentiful colored photographs to descriptions of expert growing and staging of alpines. I especially enjoy what Johnson says about control: "Most difficult of all to control, but most essential, is oneself. For a good garden is one with a plan, with variety but consistency, with a firm sense of purpose so that you know where to look and what you are supposed to enjoy. There is a perpetual temptation to anyone who loves plants to add another and another, bending his original intentions until they finally break; adding a colour that destroys a harmony, or a shape that jars, for the sake of growing something new." *The Principles of Gardening* is worth every penny of its $30 price.

My acid test for pruning instructions is always clematis. Brickell reduces that species to three pruning categories based on the age of the growth on which flowers are produced.

Hugh Johnson says "Good gardeners are constantly looking things up. The further they delve into any aspect of gardening the more eager they are to read everything that has been written on it. There is always something to learn – even if it is only another person's point of view." Two recently published series of books provide different ways of looking at familiar subjects. The first is published by the George Park Seed Company. In *Park's Success with Seeds,* the first in the series, author Ann Reilly balances concise descriptions and cultural information with Park's extensive file of photographs. The result is compact information on some 500 garden plants, house plants, and vegetables with each plant pictured in its seedling and mature stage. I find it's useful too as a mini-encyclopedia of annuals and perennials.

old subjects in new ways

Another series that looks at old sub-

continued

jects in fresh ways is the Simon and Schuster *Step-by-Step Encyclopedia of Practical Gardening* published in cooperation with the Royal Horticultural Society. From this series the volume *Pruning* by Christopher Brickell may not tell the experienced gardener anything absolutely new, but it presents the subject in simple, logical fashion with easily understood diagramatic drawings. My acid test for pruning instructions is always clematis. Brickell reduces that species to three pruning categories based on the age of the growth on which flowers are produced. Assuming you and your clematis have made it through one season together, the directions are completely understandable. The book's British origins do not affect its usefulness for American gardens.

The single subject approach, as in the *Step-by-Step* series is luxurious and concise, but often what's needed is a book that tells almost everything. James and Louise Bush-Brown's *America's Garden Book,* revised in 1980 by the New York Botanical Garden, does just that. This is a workhorse of a book that will wear out with the gardener. It is visually austere with diagramatic drawings and black and white photographs, but the information is up to date and accessible. Our Hot Line volunteers are finding the 84 pages on plant diseases and insect pests especially useful. The increased interest in meadow gardening is addressed in a chapter on prairie and meadow, which includes a listing of demonstration projects and information sources. Small properties, outdoor living areas, low maintenance plants and informal gardening are given special emphasis in this edition. The Bush-Brown legacy has been given new life.

my top choices

If I could give a new gardener two books this year, one would be the Bush-Brown for gardening outdoors, and for inside, the *Rodale Encyclopedia of Indoor Gardening.* The Rodale book, edited by Anne Halpin, is splashy, colorful and inspirational. The new gardener may want to go off in all directions at once – miniatures, bonsai, water gardens, light gardening – because all are presented so attractively. The basics are all there and a small encyclopedic section picturing in color 252 plants gives brief descriptions, culture, propagation and problems and will help with identifications. In the chapter titled "Keeping Plants Healthy," only organic controls are mentioned. Each gardener will have to decide whether organic methods suffice. Some of us will be turning to that very full chapter on pests and diseases

A book donated to the library book sale bore the inscription "Let's get our feet wet together," which sounded like great fun for the recipient of *Bog Trotting for Orchids.*

in the aforementioned *America's Garden Book:* 84 wonderful pages of ways to fight back, indoors and out.

Recently a friend donated to the library a book she categorized as "one of those spring, summer, fall, winter things. Too many outdoor plants I'm not interested in, too boring." A book that fits the seasonal format differently in that it goes from spring "maple syrup" to "mistletoe" would, I think, appeal to this friend if only because it uses words and the essay form to perfection. In *Earthly Pleasures,* Roger Swain, science editor of *Horticulture* magazine, describes the matters that we "spring, summer, fall, winter" connoisseurs enjoy but with the bite and wit and wisdom of a very literate biologist. In summer musings about cabbage he asks "How can sauerkraut at once be considered food for the gods and, as one wit put it, a form of silage (unless of course, god is a cow)?" In the essay "Zeus and the Ash Tree" Swain writes "My curiosity about lightning is tempered by a reluctance to be electrocuted." We then learn a great deal about lightning, about Swain's very practical attempts to protect the ancient ash trees near his New Hampshire house and enjoy being led to his concluding sentence: "We know that lightning is produced by the separation of electric charges within thunderclouds but we still don't know why it strikes the objects it does, and I am left wondering what the ash tree next to the house could possibly have done that upset Zeus."

While Roger Swain philosophizes about the economics of maple sugaring and the challenges of cabbages, another recent book tackles the practical details of vegetable gardening. In *Intensive Gardening Round the Year,* a threesome of Doscher, Fisher and Kolb have produced a practical manual for extending the growing season and getting more produce from whatever acreage you have. They pack a lot of information into this book and write from experience. To anyone who has used a cold frame, this paragraph rings true: "Many days we have had to make frequent trips into the garden to accommodate the fickle ways of the weather. If the day is one when the sun appears briefly and then disappears, only to return again a few hours later, you will have to make a number of journeys to your devices. All this running back and forth can get to be pretty tedious. It can be particularly bothersome when you want to go away for a weekend, or if you are a working person who is away all day. Either you will have to train your neighbors to babysit your garden or invest in only those devices that can be operated by automatic openers." This book is published in paperback with a sewn binding and tough, plasticized cover. Good information but expensive at its $15.00 price.

flower and tree identifications

The requests we receive most frequently at Christmas time are for recommendations of good flower and tree identification books. All of us would like to give the book that would mean as much as the one Gertrude Jekyll wrote about in *Wood and Garden:* "Some one gave me that excellent book, the Rev. C. A. Johns' *Flowers of the Field.* For many years I had no one to advise me (I was still quite small) how to use the book . . . but when I brought home my flowers I would take them one by one and just turn over the pages till I came to the picture that looked something like . . . I always think of that book as the most precious gift I ever received." Little Gertrude Jekyll (I picture her in a very small shawl) would have loved *The Audubon Society Field Guide to North American Wildflowers.* Clear colored photos are grouped by flower color with page references to flower families. The book, in a bright green plastic cover for the eastern edition, is field manual size and though written for adults is usable for budding Jekylls.

A superb tree identification book has recently appeared and will surely become a classic. It is *The Complete Trees of North America* by Thomas S. Elias, assistant director of the Cary Arboretum. Detailed drawings, winter/summer keys and succinct descriptions aid identifications for beginner and expert. Each listing includes a range map and the coverage is for all of North America from the Mexican border north. Although it's hefty for a manual, it would be a wonderful gift for someone traveling the country by car or moving to an unfamiliar locale. Elias says "Whenever useful, I have eliminated technical terms by substituting descriptive phrases and words more familiar to the nonspecialist. For example, the technical phrase "coriaceous, pinnately compound leaves" is rendered here simply as "leathery, feather-like leaves." Hooray!

Last Christmas I gave my gardening daughter in her twenties a book I had enjoyed immensely, Katharine White's *Onward and Upward in the Garden.* I felt I knew Katharine White as soon as I read E. B. White's introductory description of her: "I, who was the animal husbandryman on the place, in blue jeans and an old shirt, used to marvel at how unhesitatingly she would kneel in the dirt and begin grubbing about, garbed in a spotless cotton dress or a handsome tweed skirt and jacket. She simply refused to dress down to the garden: she moved in elegantly and walked among her flowers as she walked among her friends – nicely dressed, perfectly poised. If when she arrived back indoors the Ferragamos were encased in muck, she kicked them off. If the tweed suit was a mess, she sent it to the cleaner's." By the time I finished the book, sharing seed catalogs, favorite authors and poking fun at sacred cows, I felt I'd made a new friend. My choice of this book for Margie was not a roaring success. She has scarcely nibbled at it, in fact. It will take lots more years of spring seed catalogs, reading Gertrude Jeykll and Beverley Nichols before Margie delights in this book. Next time I visit her I'm going to add a line to the flyleaf: "It's a vote of confidence. Love from your mother."

The Author Recommends for Christmas Giving:

America's Garden Book. James and Louise Bush-Brown. Revised edition by the New York Botanical Garden. Scribners, NY, 1980. $22.95

Audubon Society Field Guide to North American Wildflowers, Eastern Region. William Niering and Nancy Olmstead. Knopf, NY, 1979. $9.95

The Complete Trees of North America. Thomas S. Elias. Van Nostrand, NY, 1980. $19.95

Earthly Pleasures. Roger Swain. Scribners, NY, 1981. $10.95

Intensive Gardening Round the Year. Paul Doscher, Timothy Fisher and Kathleen Kolb. Stephen Greene Press, Brattleboro, VT, 1981. $15.00

Onward and Upward in the Garden. Katharine S. White. Farrer, Straus, Giroux, NY, 1979. $12.95

Park's Success with Seeds. Ann Reilly. Geo. W. Park, Greenwood, SC, 1978. $12.95

The Principles of Gardening. Hugh Johnson. Simon and Schuster, NY, 1979. $29.95

Pruning. Step-by-Step Encyclopedia Series. Christopher Brickell. Simon and Schuster, NY, 1979. $7.95

Rodale's Encyclopedia of Indoor Gardening. Anne M. Halpin, ed. Rodale Press, Emmaus, PA, 1980. $24.95

●

Mary Lou Wolfe is PHS horticultural librarian.

growing interests



photo by Jane Pepper

euphorbia myrsinites

An English cousin introduced me to them with the enthusiastic comment "we have gone crazy over euphorbias." A trip around their Gloucestershire garden revealed they had indeed taken more than a mild fancy to this genus. Back in Philadelphia I experimented with a few and have become very fond of *Euphorbia myrsinites.* Frequently this euphorbia blooms as early as March 20, and without an early heatwave may stay in bloom for four weeks. The flowers are a bright lemon yellow, a color that is similar to that of *Aurinia saxatilis* 'Citrina' *(Alyssum saxatilis* 'Citrina') rather than the harsher *A. saxatilis* 'Basket of Gold.' The seedpods that follow are decorative, and I leave them on the plant until I see several new shoots starting at the base. This is the time to cut the seedpods to soil level and fertilize the plant with a granular fertilizer such as 10-6-4. The new glaucous blue shoots gradually develop into a neat mound that makes a good contrast to ageratum, vinca and other summer-blooming annuals at the front of a border.

Even the drought of summer 1980 didn't affect my six- or seven-year-old plants, originally grown from seed. I sowed the seeds in early spring with other perennials and had good-sized plants to set out the following spring.

Jane G. Pepper

●

Jane G. Pepper is the executive director of the Pennsylvania Horticultural Society.



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The perennials are only a small part of a city garden created on fifth of an acre. See page 14.



THE green scene

HORTICULTURE IN THE DELAWARE VALLEY
JANUARY • FEBRUARY • 1982 $1.50

The toad lily: a trifid in the garden. See page 22.

THE
green scene
HORTICULTURE IN THE DELAWARE VALLEY

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photo by Pamela Harper

Back Cover: photo by Harriett B. Green

Volume 10, Number 3 Jan./Feb. 1982

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Specializing in Dr. Martin Pole Lima Beans

by Jane G. Pepper

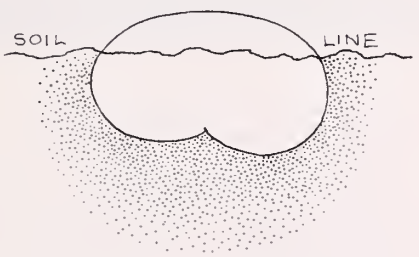
South of the Walt Whitman Bridge, in the sands of New Jersey, there is a specialized farm surrounded by large fields of corn and soybeans, tomatoes, strawberries and eggplants. But on this small farm one crop, the Dr. Martin pole lima bean, reigns supreme. The lima bean farmers, John and Janet Gyer, start in mid-April to sow seeds and set out plants. When the rest of us are on vacation they wage war against insect infestations, fungal and bacterial diseases and the weeds that escape their herbicide program. Their season ends during the cold days of winter when seeds are sorted and mailed to customers in four countries and 44 states.

Our friendship with John and Janet Gyer began when we contacted them in search of seeds of Dr. Martin pole lima beans. In the beginning our order was a simple note enclosing a check for the appropriate number of seeds. Later we began to exchange information on the past year's crop and the benefits and frustrations of growing Dr. Martin pole lima beans. Finally, last summer, we visited Fern Hill Farm one hot August evening. Together the Gyers have wrought a near miracle in developing their seven-acre farm. The lima bean is king but they also grow wonderful fruits, nuts and unusual vegetables for their own consumption and to send home with their guests.

Before we discussed the technical details of growing Dr. Martin pole limas, I just had to ask how the Gyer family became the sole large-scale producer of Dr. Martin pole lima bean seeds. Their answer involved a little history.

The origins of this bean are obscure. Some say it was developed by Edward Martin, Swarthmore College alumnus for whom Swarthmore College's biological laboratory was named. John believes it was developed by Dr. Harold Martin, a West Chester dentist who discovered the bean growing near his Cape May summer house some 50 years ago. Others have heard that Harold Martin produced the first seed as a hybrid between two still older varieties. In still another story Dr. Martin is said to have found the variety in a friend's garden between West Chester and Philadelphia. But regardless of the origin all agree that Dr. Martin meticulously selected and culled to maintain the characteristic flavor and size, a procedure that the Gyers still follow.

The history of the variety becomes clearer as time advances. In 1942 the seed was offered by Hosea Waterer (an English company with a Philadelphia base). Later the seed was sold by J.



Howard French in the village of Lima, Pennsylvania. In 1971 Howard B. French introduced the Gyers to Dr. Martin beans and heard of their interest in operating a small farm. When Mr. French decided to move to Vermont and carry on his flourishing bulb importing business from there, he asked the Gyers if they would like to grow Dr. Martin bean seed. Quickly the Gyers turned from hobby gardeners to farmers and by 1973 Howard French had started to refer his customers to the Gyers at Fern Hill Farm, Clarksboro, New Jersey, for Dr. Martin pole lima bean seeds.

Devotion to the Dr. Martin pole lima bean varies. My husband is an avowed supporter claiming the large beans have a flavor far superior to such varieties as King of the Garden or Prizetaker. I vacillate between varieties and therefore we grow at least two other varieties in addition to Dr. Martins. Since beans readily cross-pollinate growing an assortment of varieties makes us and many other gardeners dependent upon Fern Hill Farm as a source for Dr. Martin seed.

planting and germination

In early April John tills his land to prepare for planting between April 15 and May 15. Poor germination of lima bean seeds in our garden is an annual frustration so we were eager to learn the techniques by which John achieves 90% germination that early in the season. The ideal soil temperature for germination of these beans is 70-80°F, a temperature far higher than that normally found in Delaware Valley soils during John's planting season.

The Gyers have experimented with several planting and germinating techniques. One of the most successful involves planting seeds in the house or greenhouse in containers, one seed per two-inch plastic pot. They insert the seeds into a mixture of half ProMix/half perlite. Never, says John, use fresh compost to start your lima been seeds because it contains too many organisms that can rot the seeds. Instead, he advises using a mix that is sterile and porous. Peatmoss and perlite mixed half and half would be an alternative to John's mix.

Push the seeds, eyes down, into the mixture until only the tip of the back ridge is visible, then water each pot thoroughly. For the first 48 hours the mixture should be kept very moist. After this initial period keep it drier to lessen the chances of "damp off," a series of fungal diseases that rot seeds. After 10 days in warm temperatures (70-80°F) the seedlings will be ready to set outside. To leave them inside beyond this stage increases the risk of damage during transplanting.

continued



King Tent is slit at top as seedling develops. Later, string will be attached to wire bands on King Tents to provide support for bean tendrils.

photo by John Gyer

Heavy duty posts are essential to support heavy foliage production and the coming harvest. This support system is used at "Chanticleer" in Wayne.



photo by Howard Holden

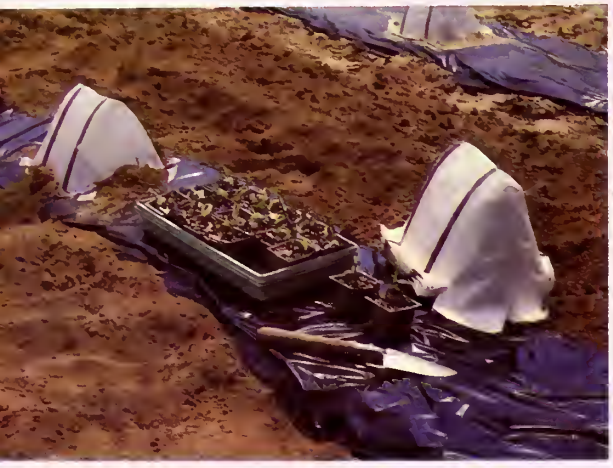


photo by John Gyer

Seedlings are planted mid-April through mid-May in black plastic.

Recently John has perfectred "pre-planting germination," an alternative technique for raising seedlings. The seeds are placed between damp paper towels in a plastic bag. For 48 hours he keeps the paper very damp then allows it to dry out slightly. After five days the seedlings are ready to transplant. The conditions in the plastic bag are ideal for the development of numerous fungi and bacteria. Therefore John suggests that gardeners only use this germination technique for seeds treated with fungicides. This year, for the first time, John will be offering his customers treated seeds with complete directions for "pre-planting germination."

If you don't plan to get a two- to three-week jump on the season by starting your lima bean seeds indoors, wait until the soil is thorougly warm before planting. The best germination we ever had was in 1980 when we did not plant our seeds until June 6. Last summer we were fooled by a short spell of warm weather in mid-May. By planting too soon we ended up having to replant not just once but sometimes twice.

John and Janet plant two seedlings per hill in hills four feet apart. They cover each hill with a large hot-kap called a King Tent (available from Orol Ledden, Center and Atlantic Avenues, Sewell, NJ 08080). In addition to providing warmth, these tents also protect the seedlings from damage by rabbits.

Before planting the Gyers lay out their Chapin Twin Wall Tubing drip irrigation system (Chapin Watermatics Inc., P.O. Box 298, 740 Water Street, Watertown, NY 13601) through which they provide all nutrients and trace elements. (See *Green Scene,* January-February 1977, p. 18). The irrigation tube is covered by a black plastic mulch *(Green Scene,* January-February, 1971). For home gardeners John advises a soil low in nitrogen with abundant phosphorus and potassium. Yellowing leaves, evident as pods start to mature, are probably due to senescence as nutrients move from leaves to pods. Ignore these, but look

continued on page 6



photo by John Gyer

The flowers on Dr. Martin limas are held well above the foliage providing easy access to pollinators.

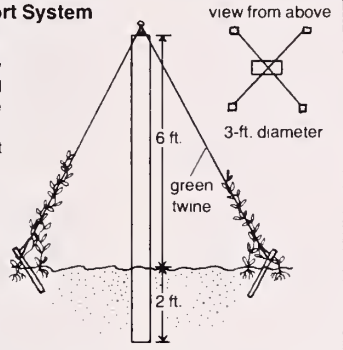
A lima bean's thick pod makes it hard to determine if seeds are ready to eat. A well-filled but not yet bulging pod is ready for the pot.



photo by John Gyer

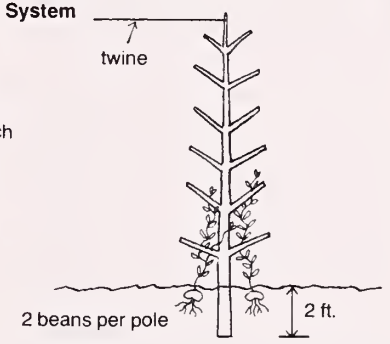
Pepper's 1981 Pole Lima Support System

In previous years we trained our beans on poles cut in neighboring woods. Many of these rotted so last year we purchased 2 x 1 in. pine, treated it with cuprinol (the only wood preserver that is not toxic to plants) and spaced them in the garden at 6-ft. intervals. Taking a cue from *Crockett's Victory Garden* we used the maypole system below with 4, 6 or 8 strings attached to one pole. By the end of the summer we had decided that 4 strings per pole with 3 vines per string was sufficient. This summer the gardening partner, never satisfied, is considering an alternative system.

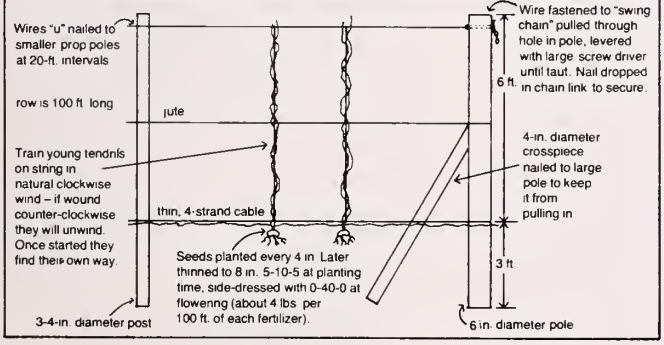


"Newport Pole" Support System

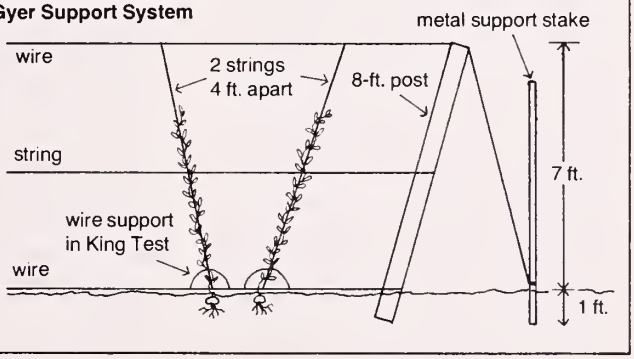
Field juniper – 7-9 ft. tall, spaced 4-5 ft. in rows, 6-7 ft. apart. 6-8 in. branch stubs left for beans to climb on. Twine may be strung from top of one pole to next to increase bearing area.



Growing Style used by Howard Holden, Superintendent at Chanticleer



Gyer Support System



out for yellow leaves with green veins which indicate a magnesium deficiency. If you see these symptoms, scatter a small handful of Epsom salts around each plant and water it into the soil.

pole supports, weeds and pests

Foliage production is heavy on all types of pole limas and a key question for lima bean growers must be how to support the jungle. Several growing systems are described in the accompanying diagrams. Whatever system you use remember that the heaviest production will result from plants spaced generously to allow maximum sun and air circulation. In a small garden the temptation is to plant too close. From bitter experience we can tell you it is not worth it.

There is a story that Dr. Martin was well aware of the need for light and sun. It is said that he planted his beans in rows that ran east-west. The rows were spaced so that the shadow of one at noon on the summer solstice just reached the base of the next.

Weeds are just one of the enemies the lima bean grower must tackle. In our garden we deal with them by mulching generously with leaves and grass clippings in early summer after the plants are well established. Never, however, use clippings from a lawn treated within the previous six weeks with herbicide. John keeps a weed-free patch (essential in order to have his seeds approved for certification by the State of New Jersey) by using black plastic as a mulch and treating the soil between the rows with pre-emergent herbicides.

For the home gardener the Mexican bean beetle causes a great deal of damage when its larvae feed on the undersides of the leaves. For the Gyers, fungi, bacterial diseases and the harlequin bug create additional headaches as they seek to produce high quality seeds for certification and sale. Consequently John sprays every 7 to 14 days with a mixture of fungicides and insecticides. In our garden we make a daily patrol from mid-July to seek and destroy the Mexican bean beetles as they congregate. If we are vigilant we can keep the population within mangeable proportions. Sevin, an insecticide effective against the Mexican bean beetle, should not be used because, in addition to inducing some bud drop, it is highly toxic to bees. Bumblebees, as lima bean growers know well, are the primary lima bean pollinators. As an alternative John suggests using malathion or rotenone at dusk. Follow manufacturer's spraying directions carefully.

harvesting

For us, the lima bean season culminates with the picking, a task that must be done when the vines are dry to avoid spreading diseases. The lima bean's thick pod makes it hard to determine if the seeds are ready to eat. To make sure, hold the pod up to the light. A well-filled but not yet bulging pod is ready for the pot. We find them best at ½ to ¾ full maturity. For the Dr. Martin this is between the size of a nickel and the size of a quarter. If planted in late May, pole lima beans will start to bear in late August and will continue to produce until early October. They freeze well so save your surplus for mid-winter meals.

The Gyers pick beans when the pods ripen. The pods are thoroughly dried on special racks in the barn with a constant draft of forced air blowing over them. Depending on the weather drying takes about four weeks. Once dry they are shelled and each seed is checked for blemishes and sorted for mailing. All damaged seeds are destroyed. Top quality specimens will be sold for 15¢ apiece this season as state-certified seeds. Those that have minor blemishes will be offered to customers at 8¢ apiece.

●

Jane and Wing Pepper enjoy growing Dr. Martin pole lima beans and rarely feel they have enough to eat and freeze from their small garden. Jane Pepper is executive director of the Pennsylvania Horticultural Society and writes a weekly gardening column in the Arts & Leisure Section of the Sunday *Inquirer*.

Through their annual communications with their customers John and Janet have accumulated reports from lima bean growers throughout America. The selection of letters reprinted here indicates that these big beans have a devoted following. My gardening partner and I are grateful to the Gyers for perpetuating this old variety. There's nothing more satisfying in August than to pick the first large basket of Dr. Martin pole lima beans.

Illinois–We really enjoyed the Dr. Martin beans. So different in flavor than any others. Just got them planted a little late to get a good crop and then 23 head feeder cattle got in the garden one night and tore up most of them. I use No. 9 wire with binder twine down to plants. Feeders just went in and out down the row.

Pennsylvania–Had such a bumper crop two years ago didn't plant any last summer–still eating out of the freezer, but getting low now.

North Dakota–I'd like to buy enough bean seed to make a large row of beans. I'd like to know their size. Only interested in Biggest and Best.

Pennsylvania–I'd like to congratulate you for perpetuating this wonderful breed of lima beans. We knew it a few years ago and then lost track of it. Keep up the good work!

Nebraska–We have been raising these lima beans for many years, maybe about twenty years. We have had very good luck with them here in Northeastern Nebraska, and would heartily recommend them... It seems that seed planted about June 1 does as well as that planted earlier. We harvest about September 1... I have about 80 ft. of lima bean fence behind my office. Our yield will vary. Those sections getting shade show a marked reduction in yield.

Maryland–I went to a party yesterday and you will be pleased to know people kept handing me dollars to get them some of "those wonderful lima beans." So send me ten more, as I have already given the other three away, with the four last night.

Massachusetts–My only problem with your great beans has been support. I have been using heavy 8 ft. steel stakes and aluminum 4-in. mesh wire. The plants have grown to such proportions that their weight literally tore the welded bonds of the wire apart–I shall have to seek still heavier material. Thanks for a great product!

Seed Certification

In 1974 the Gyers demonstrated through a series of tests that Fern Hill Farm Dr. Martin pole lima bean seed is a variety distinct from any other commercial form.

Each year the Gyers must reapply for New Jersey certification. Periodically throughout the summer an inspector visits the farm to check for virus and diseases and to make sure the fields are free of weeds. At harvest time the Gyers send a generous sample to the New Jersey Department of Agriculture certification laboratories where the seeds are tested for trueness to type, freedom from diseases and germination potential. On successful completion of all tests John packages his certified grade seeds with official New Jersey numbered certification seals.

John Gyer's cooking instructions for Dr. Martin pole lima beans

To maintain best flavor and color, John cooks lima beans in a pressure cooker. He puts a small batch of beans (three cups maximum) on a rack in a cooker over about ½ inch of water. Bring to pressure and cook for one to two minutes; remove from heat; cool the cooker under running water until it can be safely opened. Put beans in a warm dish and mix with butter, a squeeze of lemon juice, salt, a pinch of sugar, and a few spoonsful of the hot cooking water. Set aside for about five minutes to let the beans absorb the juices, then serve.

To order Fern Hill Farm Dr. Martin Pole Lima Bean Seeds write:

Fern Hill Farm
Jessup Mill Road
Clarksboro, NJ 08020

A Time to Reap

by Harriett B. Green
and Beatrice M. Solomon



photos by Harriett B. Green

Plants are an integral part of developing new skills at an adult learning center. Here a student prepares the base of a paperweight before placing the dome.

Mrs. R. was practicing bird calls as she watered plants from her motorized wheelchair. Mrs. B., recently recovered from a hip fracture sustained when she slipped during a dance contest, was doing deep bending exercises while examining cuttings. The 80-year-old Mrs. B. is a "charter member" of the indoor gardening club, which meets weekly at the high-rise retirement facility where she lives. She also volunteers at a nearby hospital, maintains relationships with her circle of friends, is still going strong. With her partner for the day she was deciding whether the cuttings were rooted and ready for transplanting. They chose carefully, then mixed and moistened the soil, prepared the crock, and washed the pots that would receive the plants. At the other end of the table another woman was finishing a pressed flower greeting card to send to her grandchild, while still others were sorting and storing a variety of pressed flowers for future use. The room was alive with activity. Well into its third year, the indoor garden club is thriving.

When we were invited to introduce and develop our first program in house plant care for a group of senior adults living in this building, we were delighted. Both of us recently had earned a degree in horticulture, supplemented by courses in psychology and hortitherapy. We had done related volunteer work in various agencies and institutions and had observed horticultural therapy programs, especially those designed for the elderly. During that time we found that we were increasingly drawn to working with the older adult who was relatively well and independent but who needed some satisfying interests to fill the newly available leisure hours. Personally and professionally we were committed to horticulture as a life-enriching activity, and when the call came we were ready to put it all together. We knew that working with plants is a viable therapy for relieving stress as well as a rewarding activity at any age. Lively and informative plant culture programs, with "take home" value, could help fill this life passage gap. Being untried, we were a little uncertain about transmitting our enthusiasm or being the conduit for new learning experiences for others. Happily, it turns out, we needn't have been concerned. With that first group, as with subsequent groups, we saw that plants "sell themselves," that we were able to develop pleasant, sharing relationships, and that we enjoyed teaching, yet found ourselves learning as well. An additional plus was our maturity, which proved to be an asset in relating to seniors.

We have become expert recyclers and scroungers.

From the start we realized we might find physical, psychological, and social deficits in this age group, and it would be necessary to be realistic in our goals and undertakings. After all, plants cannot turn back the clock. They cannot relieve the pain of arthritis, restore hearing or sight, or reverse diminishing function; nor can they lessen the sadness of death and separation or make loss of privacy more palatable. However, plants, even a few on a windowsill, can stimulate aesthetic sensibilities as well as heighten appreciation for nature's

continued

A Time to Reap
continued



Potting-up at the Open Door Senior Adult Center at 70th and Woodland

regenerative cycles. Working with plants in groups can open doors to new interests, experiences and friendships. That is what we focused on.

Who are the people with whom we've been working? They are men and women who have retired recently from jobs outside the home and homemakers whose chores are now minimal. While some are financially comfortable, others are of modest, even meager, means. Some live in their own homes; others in retirement communities. While some enjoy good health, there are those who have limiting physical problems such as rheumatic disease, deafness, failing eyesight. With such diversity, plants are the catalyst, the common thread that binds the 90-year-old woman in a life-care community to the 65-year-old newly retired man who is "beginning to live." She is nostalgic, remembering her garden; he has time and freedom now to attend classes at his local senior adult center and enjoy a creative retirement, using the energy formerly required for the day-to-day job to pursue his stored-up interests.

We have observed their willingness to take the risk with the novel, the untried, and have been gratified by the high level of potential and creativity often waiting for a bit of direction and encouragement. One group, though never having done this work before, consistently has made exquisite pressed flower stationery, book marks, and dried flower paperweights. That self-image can be enhanced by such tangible achievement has been demonstrated to us again and again. The pride reflected in the face of a woman carrying home her well-designed arrangement of dried flowers was further evidence of this as she called out gleefully, "Wait until my daughter-in-law sees *this*."

It is relatively easy for the horticulturist or home gardener who would like to work with such groups to find a place. Recreation and program directors generally welcome volunteers. However, whether a volunteer or a paid worker, one might find funding for supplies and other needs inadequate, since most organizations and institutions that offer senior adult activities frequently operate on a deficit budget. One of our programs was started with a small "seed money" fund. From the sale of the group's products at their Christmas bazaar, and by having people pay for materials they used in personal projects, the program has remained solvent. Occasionally, we have received contributions of plants, pots, and crafts supplies. The Indoor Light Gardening Society generously provided, on loan, equipment for use of one group, and the Delaware Valley Regional Chapter of the National Council for Therapy and Rehabilitation through Horticulture* has been particularly generous in supplying materials, ideas, and encouragement. Then too, we have become expert recyclers and scroungers. We are no longer reticent about asking friends and colleagues for pots and cuttings, and in the spring and summer we collect, press, and dry whatever our clippers can reach and propagate to within an inch of our windowsills.

Since that day when we presented ourselves to the first group, meeting in the laundry room annex of a federally-supported residence for senior citizens, we have worked in a variety of situations. In an informal classroom setting

*Delaware Valley Regional Chapter NCTRH, c/o Friends Hospital, Roosevelt and Adams Avenue, Philadelphia, PA 19124.

we have taught home-based retirees a course in basic botany, including a lecture accompanied by demonstration and hands-on practical experience. In a life-care facility and a day-care senior citizen center, basic information has been worked into the demonstration and "doing," the emphasis here being placed on the product to be taken home. With each group we get a "feel" for the abilities, experience and limitations so we can modify, adapt, or expand the presentation to suit the people. To every group, however, on whatever level we find them, we bring a basketful of plants, supplies, and tools, and a head full of ideas for their use. Moreover, we bring ourselves, our interests, our experience, and our desire for a mutual exploration of the relationship of plants and people.

Perhaps our most moving recollection is of a gentle, alert 91-year-old woman in the life-care facility where we led a group once a week. Each time the garden club met she joined us, making her way very slowly and painstakingly down the long community room. We learned she had enjoyed a fair-sized garden in her own home and had shared a gardening interest with her husband. He had died only two years before, and she now felt quite alone. Still, she came each week. "When I am here," she said, "I feel for a little while as if I am back in my own garden." She still finds plants a source of pleasure, a connection with the life she once knew.

The people with whom we've worked in these programs have gained new skills and a new awareness of the world around them. Some new skills might take a bit longer to perform in later life, and physical assistance might be required. But the challenge of learning something new is as valid and important to the older person as to the young. Above all, the good news is that any one of us, at any time in our lives, may participate in the learning-teaching-learning relationship, using the practice and art of horticulture to transcend barriers, to make the human connections.

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Harriett B. Green received her associate degree in horticulture at Ambler Campus, Temple University. She is also an alumna of the Arboretum of the Barnes Foundation. Beatrice M. Solomon is a graduate of the Arboretum of the Barnes Foundation.



Bunny Love (left) and Emma Friedman, members of the Pavilion Garden Club, pot up cuttings they had rooted for a bazaar.



Sadie Lazowik (left) and Emma Friedman work with pressed flowers creating paperweights and greeting cards for the bazaar. Money for the materials came from a revolving fund, set up with profits from past sales.

A Second Story Window box for Herbs



by Patricia Schrieber

Can a native of Crete thrive without problems in Philadelphia?

I asked myself that question last May at the annual Plant Sale sponsored by the Philadelphia Unit of the Herb Society. I was thinking of buying a dittany of Crete to grow in one of two window boxes I was about to place outside my second story apartment in the art museum area.

I had been to the Herb Sale in past years and knew that even without intending to buy, you can learn a great deal about herbs there. All plant labels bear both botanical and common names, and growing tips are neatly displayed near each group of plants. In fact, with a bit of luck, the grower of a plant you like may be close by, willing to share information not always found in the more reliable herb books. Fortunately for me, Nancy Howard (of the Herb Society) suggested that I try planting the dittany, usually a challenge to grow, in a clay pot before placing it in the window box. She explained that by keeping it drier than the other herbs around it, the chances of its survival would almost be assured.

Before setting out for the sale, I had checked the existing site conditions and figured that the hot summer sun on the west-facing boxes would be just fine for growing most herbs. A more difficult question to answer was whether or not the dittany, along with other herbs I might select, could tolerate the windy exposure.

As I carefully inspected the array of plants available at the sale, I started choosing from those herbs with a one foot growth limit, since I wanted a clear view out the windows. Because wind tolerance was not indicated on any of the labels, I could only wait to see how the herbs would adjust to their new surroundings. Although it was hard narrowing the field from all those plants grown so well by members of the Herb Society, I finally made my selection. In addition to the silver foliage of the dittany of Crete, I chose color accents provided by the foliage of tricolor garden sage (cream, green and red), golden oregano, 'French Lace' geranium (cream and green), and 'Silver King' artemisia (also silver). Fine textured plants included green santolina, true myrtle and curly parsley (which was edible as well). I picked prostrate rosemary and fuzzy thyme for their ground-hugging forms, and chives for their fountain effect and usefulness in a summer salad.

The nicest development of all was the dittany of Crete. Well suited to its own pot, the dittany required little watering and no pruning.

planting

Back at home, I worked out a planting scheme for both window boxes, based on the form, expected height and foliage color of each plant. (By the way, the notes you took at the sale will be invaluable in your planning.) The two wooden boxes, with three drainage holes drilled in the bottom of each, were firmly secured to the outside windowsills and filled with a lightweight, well-draining mixture of soil, perlite and coarse sand, in proportions of 2:2:1. I removed the herbs from their small pots and carefully loosened the roots. To prevent excessive transpiration while the plants were getting established, I pruned the four-inch stems and leaves to one-third their size. I followed Nancy Howard's advice and potted the dittany in a four-inch clay pot before planting it.

After planting, I sat back for a good look at all the herbs. Although all the other plants appeared well set, I could see that the tender stems of the lavender, geranium, and myrtle could use some protection against the wind. So I fashioned small plastic collars, cut from a bottle, each two inches in diameter and one and a half inches high, and fitted one around the base of each plant anchored with soil to form a windbreak.

From the first day I planted the window boxes in the middle of May, sampling the herbal fragrances became a daily habit. I studied individual plant growth, noting that the sage, chives and artemisia pushed out new leaves almost immediately after planting. The lavender, geranium and myrtle, all safe from the wind, quickly established themselves. The santolina, parsley and dittany were slow starters, but there were no signs of any problems. By early June, only the golden oregano had succumbed, perhaps because of too much moisture. Having removed the oregano, I rearranged several plants to fill the empty spot.

During June, the remaining herbs successfully weathered their transplant shock. The lavender, geranium and myrtle were all thriving and no longer needed the collars to support them

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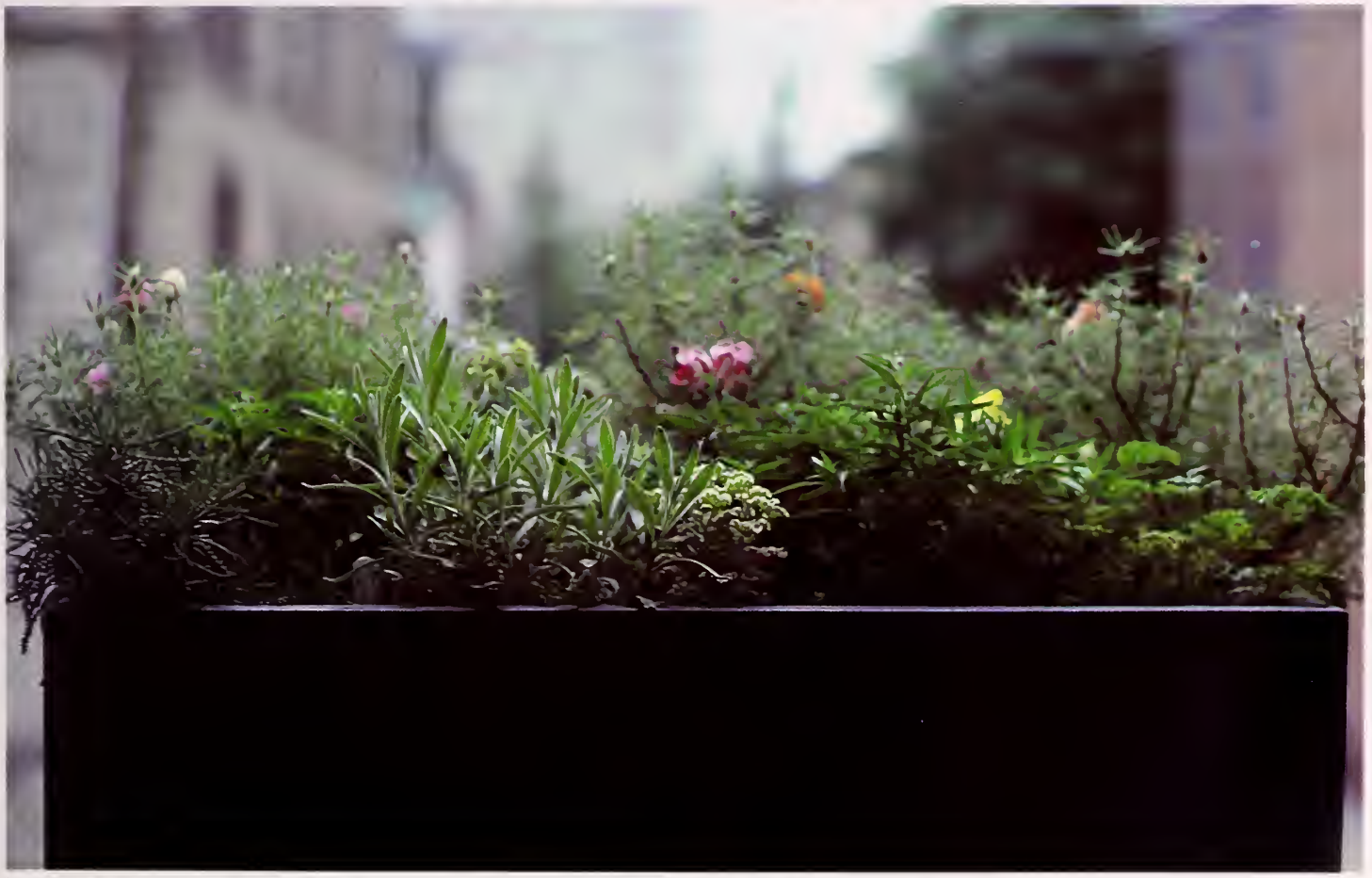


photos by Patricia Schrieber

Window boxes with a windy, western exposure.

Dittany of Crete





Light foliage at 6 o'clock 'French Lace' geraniums. Pink flowers directly behind, and yellow flowers to the right, 'Floral Carpet' snapdragons. Leaves in left foreground are various-leaved lavender. Barely visible behind the lavender is dittany of Crete.



A Second Story Window box for Herbs

against the wind.

In mid-June I planted a few dwarf snapdragons for splashes of bright color among the more subtle hues of the herbs. I even added several plants of portulaca and trailing vinca near the front edge of each box. By pinching often, I hoped to train the plants to drape over the sides of the boxes.

maintenance

Careful maintenance was necessary to keep so many different plants growing in a combined area of four square feet, and in soil six inches deep. By limiting watering to every three or four days and fertilizing no more than every two weeks from planting until the middle of July, I was able to curtail the growth of all the plants in the window boxes.

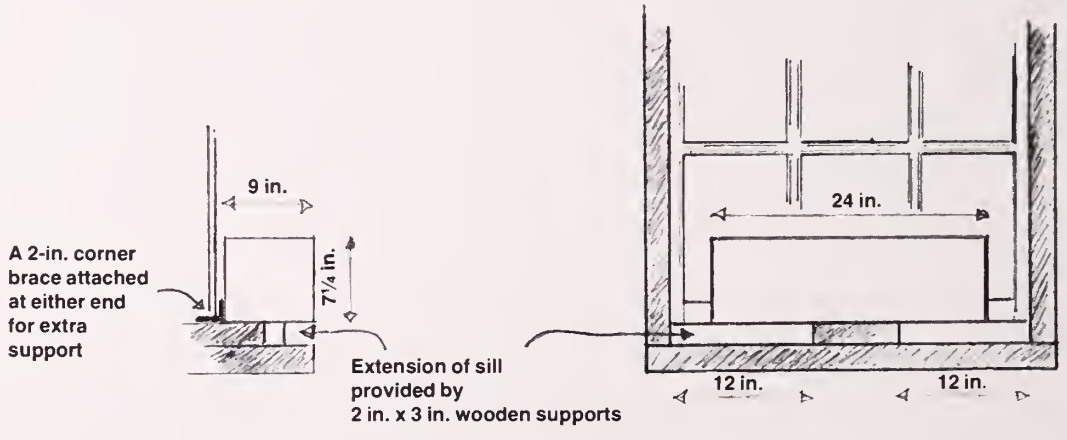
Following a regimen of judicious pruning, it was easy for me to keep the more vigorous plants within bounds. The snapdragons and portulaca produced new flowers and foliage faster than I could trim the older ones. The artemisia, unknown to me when I planted it, was stoloniferous, sending up new shoots whenever it had a chance. The sage, chives and parsley all grew rapidly, and continued to thrive after shearing in July and August.

Of course, some plants needed little or no pruning. The santolina's bushy habit was easy to maintain with only an occasional pinch. The lavender, growing slowly, required no cutting back until late September. The geranium remained smaller than I had expected, possibly because of crowded roots.

As in any growing venture, there were some surprises. When I removed the windbreak from the myrtle in late June, I potted it up in a three-inch clay pot with the thought of pruning it as a formal plant. By late July, I noticed that it was developing an interesting shape on its own, with the help of the prevailing winds. The nicest development of all was the dittany of Crete. Well suited to its own pot, the dittany required little watering and no pruning. It began blooming in early August and was still flowering when I entered it in the Harvest Show in late September. Although I hoped to get a ribbon at the show for encouraging the difficult dittany to survive so beautifully, the judges did not agree. I learned a valuable lesson: it is wise to consider the container as well as the condition of the plant itself when preparing to exhibit.

By the middle of August, I was planning to leave for vacation. Just before going on the three-week trip, I cut back those plants that grew more quickly: the snapdragons, portulaca, chives and parsley. I left the other herbs to produce enough foliage to enter in the Cut Herb Classes at the Harvest Show. Unfortunately the friend I left in charge knew almost nothing about plants.

I returned home in September to a jungle of foliage in the boxes. The snapdragons and portulaca had grown



all over the place. All the herbs had put out lots of new growth, except for the thyme which died, either from a little too much water or maybe as a final protest against being shaded for so long. I managed to control my passion for pruning until two days before Harvest Show registration, when I trimmed the herbs to make two small-scale arrangements: one of fragrant herbs that won a second prize, and the other, a collection of fragrant and culinary herbs that received an honorable mention. The judges' comments on this second arrangement, only four inches tall, complimented its scale and condition of material, judging it to be a "perfect miniature."

Even before setting the window boxes to rest for the season, I started planning for my next season's planting. In late September, I brought in the pots of tender dittany of Crete and true myrtle. I hung both pots in an east window for the fall and winter, with hopes of returning them to the window boxes next May. The 'French Lace' geranium and the various-leaved lavender are also tender. In the first week of October, I took four-inch cuttings from the parent plants to start the next generation for the new season, rooting them in a half-peat, half-sand medium, and placed in the same window as the other two plants.

I managed to control my passion for pruning until two days before Harvest Show.

I am curious to see which of the herbs left outside will be hardy enough to withstand the persistent winter winds. The tricolor garden sage, green santolina, chives or curly parsley? Although the 'Silver King' artemisia may survive, it occupied too much space in the box and I must find it a new home before next spring.

The cascading portulaca proved eye-catching, but required considerable maintenance to obtain this effect. The next time I would like to plant trailing lobelia, which can be left to develop its own form.

At the next Herb Sale, scheduled for May 13, at Joanna and George Reed's in Malvern, Chester County, I will definitely remember my first experience growing herbs and will think twice before buying quite as many varieties for my window boxes. But then again, the pots of young herbs at the sale can look so enticing, I may have to set up another window box to fit them all.

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Patricia Schrieber is the landscape designer for Philadelphia Green, the community outreach program sponsored by PHS. She graduated from Temple University, Ambler, with an associate degree in landscape design. She joined PHS in 1978 as a street tree coordinator. While a student, Schrieber held a one-year internship at the Morris Arboretum.

PLANT LIST

Botanical Name	Common Name	Planted	Began Flowering	Died	Harvested
HERBS					
Allium schoenoprasum	Chives	5/17	5/25		7/14, 8/20
Artemisia ludoviciana 'Silver-King'	'Silver-King' artemisia	5/17	9/10		
Lavandula x heterophylla	Various-leaved lavender	5/17			9/23
Myrtus communis	True myrtle	5/17			
Origanum dictamnus	Dittany of Crete	5/17	8/4		
Origanum vulgare 'Aureum'	Golden oregano	5/17		6/5	
Pelargonium crispum 'Prince Rupert'	'French Lace' geranium	5/17			9/23
Petroselinum crispum	Curly parsley	5/17			7/14, 8/20, 9/23
Rosmarinus prostratus	Prostrate rosemary	5/17			
Salvia officinalis 'Tricolor'	Tricolor garden sage	5/17			9/23
Santolina virens	Green santolina	5/17			9/23
Thymus glabrescens	Fuzzy thyme	5/17		9/15	
ANNUALS					
Antirrhinum 'Floral Carpet'	Dwarf snapdragon	6/17	8/7		8/20
Portulaca 'Double Flower'	Hybrid portulaca	6/17	6/23		8/20

flowers along the fast lane

by Catherine B. Fessenden



Author takes a moment to photograph bird's foot trefoil on the Taconic State Parkway in New York.

A few summers ago my husband and I were driving from Pennsylvania to northern New England and chose to travel part of the way on the Taconic Parkway in New York State. The day was bright and sunny in early July. Much to my surprise and delight, sizable sections of the grassy areas that line the Parkway were a mass of low golden flowers that literally gleamed and shone in the sunlight.

It was a while before I had an opportunity to investigate the little flower that provided such a breathtaking sight along the Parkway. It proved to be bird's-foot trefoil *(Lotus corniculatus)* spread out in low dense mats of thousands of plants instead of the modest clumps that I was accustomed to seeing in Pennsylvania.

I had always assumed that its common name derived from the shape of its leaves, the ends of which are in three narrow segments in the same pattern as a bird's foot. One autumn recently I discovered some roadside plants that had gone to seed and saw that the long palmate seed pods hung down exactly like the long toes of a grouse-sized bird, hence doubling the appropriateness of its name. The generic name, lotus, is an old Greek word applied to various plants. Linnaeus restricted it to those that are clover-like. (The oriental, sacred lotus is a member of the waterlily family.) *Corniculatus* means horned, referring perhaps to the way the standard (uppermost) petal of this pea flower flares upward and curls back.

Ever since coming upon that spectacular sample of roadside flowers, I have noticed with much more care and pleasure the patches of color that one sees along most roads in the growing season. Some years ago as a tourist, I remember exclaiming about the red poppies in the fields of France. No less beautiful are the orange-gold California poppies of our far west. I hope every reader has experienced at some time the excitement of coming upon a mass of brilliant roadside color.

I suspect, though, that many of us do not stop often enough to take a close look at the smaller, less conspicuous but equally beautiful blossoms on the roadside. The following species are common in Pennsylvania as well as in many parts of our country, especially the northeast.

chicory

Everyone knows, I'm sure, the common and widespread flower of chicory *(Cicorium intybus),* which is an immigrant from Europe. The most beautiful stand that I have come across was on a light but foggy morning on a back country road of Pennsylvania. Because of the high fog the early morning light was evenly diffused and quite bright, making more luminous than usual the line of smiling blue that ran between the road and a cultivated field on our left.

Some other common names for chicory are succory, blue sailors or blue daisies. The name actually comes from an old Arabic word, not surprising since records show that the Egyptians boiled and ate the roots. Today, as for many centuries, chicory roots are dried and ground into a powder that is then mixed with coffee to stretch supplies, or it is used as a coffee substitute. The French force and blanch the young leaves and eat them as a slightly bitter salad green.

Although usually a pale delft blue, the

continued



Close-up of bird's foot trefoil



photos by Catherine B. Fessenden



White sweet clover



Roadside fireweed in Pennsylvania

blooms are occasionally white or more rarely pinkish. They grow very close to the stem, and when in clusters often only one flower opens at a time and then mostly in the mornings. Each bloom is a composite of ray (or petal) flowers only. The stems are quite tall, growing up to four feet and having a somewhat zigzag growth pattern. When open the bright flowers are a refreshing sight, for their simplicity and clear blue color convey a sense of lively innocence.

black-eyed susan

A common native flower that is rugged and prefers hot sunny wastelands and fields is the handsome black-eyed Susan *(Rudbeckia serotina)*. Some people call it yellow daisy or golden Jerusalem. Its scientific name honors Olaf Rudbeck, professor of botany at Upsala, who befriended Linnaeus, taking the impoverished young scientist into his home and helping him to further his career in several ways. I have found no record of who Susan was, but since the flower is a glowing beauty, it is likely that the same could be said of Susan.

Its nectar is at the bottom of the deep, tightly packed tubular brown florets in the center (the black eye) and can be reached only by insects with long slender tongue or proboscis, such as bees, wasps and butterflies. The bloom of the central florets occur successively, creating a narrow ring of yellow when the pollen is ripe. Each yellow petal is a neutral flower and contributes to the reproductive system only by the flashy color that attracts potential pollinators. Its seed head is a masterpiece of precise, geometrical design, often remaining on the bare brown stem all winter and sometimes making handsome shadow patterns on the snow's surface.

Black-eyed Susans are known as pioneer plants, a valuable trait as they will grow in barren, eroding soil, holding it until other plants can get started. On the other hand, they can be a severe problem for farmers to eradicate. I noticed and admired a field of black-eyed



Black-eyed Susan



Seed head (black-eyed Susan)

Susans for two or three consecutive years on a route in Pennsylvania that I traveled regularly. This past year, alas for my enjoyment, the owner of that field kept it mowed, perhaps because he was trying to rid the soil of its golden pest before plowing and planting.

clover

More old world immigrants with much more delicate flowers are the white and yellow wild sweet clovers *(Melilotus albus* and *M. officinalis).* The word clover comes from the Latin, *clava,* meaning club. Hercules wielded a club with three prongs, which the three clover leaves are said to resemble. Botanists consider these two clovers as separate species, though to the layman they appear identical except for the two different colors of their blossoms.

One of the highlights of a vacation spent in Colorado a couple of summers ago was an evening walk along a dirt road in the foothills of the Rockies when the yellow sweet clover was in bloom in thick stands for several miles. The late, slanted sunlight intensified the yellow spikes of bloom so that the roadsides were bathed in a pervasive golden glow.

Clover is a most useful and attractive member of the bean family. Its roots contain nitrogen fixing bacteria, thus enriching the soil as well as holding it by means of a deeply penetrating tap root. As a hay crop, the plant yields especially well in the second year and provides good early grazing.

Because their finely formed flowers are clustered in spikes at the top of stems from 2 to 5 ft. tall, they are conspicuous to immense numbers and varieties of insects. The floret has a closed shape that protects the nectar and pollen from rain. When a bee alights, her slight weight depresses the lower, joined petals, which opens the flower. After drinking its nectar and incidentally pollinating it, the bee departs and as she flies off, the flower closes again.

loosestrife

A late summer flower that my husband and I have found both impressive and prolific in wetland areas is purple loosestrife *(Lythrum salicaria).* We have seen long stretches of this tall, spiky, reddish-purple flower along I-84 in Pennsylvania and New York State, and it flourishes in many other places along streams, lakes and swampy meadows.

Other common names for this species of loosestrife are long purples, spiked loosestrife and spiked willow-herb. At one time people thought, mistakenly, that the name was from a word meaning "loosing" or "ending" strife. These plants were said to make animals more tractable, so they were hung upon the yokes of oxen. They also have the reputation of repelling flies and may have helped to soothe animals in that way. Sometimes the dried herb was burned in houses so the smoke would drive away flies and perhaps even snakes.

Where fireweed is growing thickly, these little white parachutes are profuse and the plants look as if a bale of cotton had been partially dumped on the flower spikes and had been blown every which way.

An unusual feature of each blossom is that the stigma grows to one of three different lengths and the stamens come in two out of three different lengths. Whenever the stigma of a single flower is in one of the three positions, the two sets of stamens occupy the other two positions. Darwin proved that only pollen from the shortest stamens, for example, would effectively fertilize the shortest pistils. The same is true for the middle-length and the longest pistils and stamens, thus ensuring cross-pollination. Flowers with this kind of structure are known as "trimorphic."

fireweed

Vaguely similar and even more widespread is fireweed *(Epilobium angustifolium),* though one good look at each species will suffice to dispel any confusion. Visually the flower spikes of purple loosestrife are much more dense and tightly compacted, while fireweed has a looser more widespread growth form.

Fireweed proliferates in clearings of all kinds, but its capacity to be one of the first plants to grow in large masses in burned-over areas, where the habitat is appropriate, accounts for its name. Among many alternate names are purple rocket, Indian wickup and great or spiked willow herb. Some other wild flowers are also called fireweed, but this particular one is much the most spectacular. The scientific name *Epilobium* comes from two Greek words meaning upon the pods or standing on top of pod-like seed cases, and *angustifolium* means narrow leaved or willow-like.

Fireweed is a splendid tall pink spike of smallish blooms with rounded petals, which open successively beginning at the bottom. On the same stalk at the same time one finds, from the top down, flower buds, fully matured blossoms and seedpods. The plant stems are 2 to 8 ft. tall, are smooth and have narrow, tapering, willow-like leaves. The seedpods are beautiful with a violet-pink tinge to their slender velvety capsules of two or more inches in length. When the pod is mature, it splits open lengthwise and fluffy white tufts, each with a tiny seed attached, are released into the wind, somewhat like a delicate milkweed seed. Where the plant is growing thickly, these little white parachutes are profuse and the plants look as if a bale of cotton had been partially dumped on the flower spikes and had been blown every which way.

I have seen magnificent stands in Alaska, as well as in many of the lower forty-eight states. You can't mistake it once you examine it at close range.

There are dozens and dozens of other species that line our roads and fields – some in great numbers and some in only occasional clumps. The banks of a few interstate highways have been sown with flower seed to make good ground cover and to hold the soil. The miles of pink crown vetch that we find in some

continued



Purple loosestrife on I-84



Chicory, also called blue sailors

areas are the result of such deliberate planting.

For me, driving for short distances or long ones has become more intriguing as I have become increasingly familiar with the variety and enchantment of our roadside flowers. Even while traveling in the fast lane it is easy for a passenger to spot clumps of flowers except for the smallest. If I am driving alone, I satisfy myself by noticing only the fields that are bright with color or the lines of flowers that often follow our highways. Upon seeing them I usually begin to plot how and where I might be able to stop for either fuller enjoyment or investigation or both. If I must keep going in those fast lanes, I simply feel grateful for the flowers along the way.

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Catherine Fessenden, photographer and lecturer, has a constantly developing interest in the beauty and variety of plant form and design. She enjoys sharing her delight in seeing and enjoying the natural world around her.



photos by the author

The pumpkin patch on the lawn

HOW WE STOPPED MOWING: *Strip Gardening on the Lawn*



Some variety from the September harvest

by Betsy Shuman

Even before we moved into our house with its attached two acres, we wondered about the lawn. It was about an acre of beautiful green grass. The house sits on a ridge and the front lawn slopes slightly to the south. We wondered if we really wanted to bother mowing that emerald sea. It seemed as though mowing that space was a time consuming luxury. Maybe we could do something else with it?

Sheep. We liked that idea. Sheep and a few goats would add a lovely pastoral quality to the landscape. From the living room windows we'd be able to watch the lambs and kids frolic in the spring. But dogs abound in the area, and we were sure that our lovely pets would quickly be fair game for them. We thought of meadow gardening. Just mow a section close to the house, then let the rest go. Meadow gardening isn't just "letting the rest go," however, so that didn't seem to be the answer either.

continued



These and other alternatives rolled by and the grass kept growing, so we kept on mowing. With the somewhat poky riding mower we inherited with the house it took more than three hours to mow the lawn, not counting the time to trim around small trees and shrubs along the road. One year we hitched a set of gang reels with a six-foot cut to the back of our faithful, if old, VW, and mowing time was cut in sixths. It was easily the most pleasant way to mow, out of the hot sun, in a comfortable seat with the radio on (rather loudly to cover the sound of the reels clicking). But we discovered that we had to mow more frequently because the grass must be less than six inches for the gang reels to work properly. And the lawn was not the luscious weed-free thing you might be imagining. Green things were growing that a good dose of 2,4,D would take care of. After all, it was the total effect that we were after. In the spring the bright yellow dandelion flowers looked positively beautiful with the rich green spring growth and I would always have John wait until they'd finished blooming before he mowed for the first time. Often the weeds would be taller than the grass, causing problems as they will. The gang reels would just bend them over, and they'd pop back up before we'd parked the car.

Each year as we mowed for the last time we'd say, no more next year. Even with a new powerful mower it took more time than we wanted to give it. So in February John asked "What can we grow out there that we can sell?" His idea was to put the land to work for us. Raspberries? No, should have started preparations last fall. Strawberries? Same thing. We needed a crop that would mature in one season, a fruit or vegetable that would be ready in August or September. Watermelons? Why not? I did some research and discovered that watermelons aren't too well suited for this climate; our summers aren't long or hot enough. But the aspect was perfect, we'd mulch them well; we'd give it a try. If it didn't work, we'd just mow them down.

Sheep and a few goats would add a lovely pastoral quality to our landscape.

As soon as we could in April we started rototilling. John's idea was to have long narrow rows of garden, wide enough for the crops to be sown, with grass between the rows. That way we wouldn't have to walk on the soil where the roots of the crops were. We prepared three rows about 90 ft. long by 3 ft. wide, with 15 ft. between rows. It was serious work, loosening up the sod and working the soil to a reasonable state of fertility. John didn't know he had that much farmer in him. After tilling each row about 10 times we spread a good thick layer of decomposed chicken manure and wood ashes saved all winter from our two wood burning stoves onto the rows. Then we tilled again. We had expanded our original idea to include pumpkins along with the watermelons. Everyone we talked to about our project, bar none, said it wouldn't work. Just can't grow melons in these parts and have them ripe in August when folks want to eat them. Farmers said that, our neighbors who had "gardened for years" said that. We thought to ourselves, "Well, we're going to grow them, watch and see," and planted a row of pumpkins, just to be safe, you know, never



Watermelon is in the foreground; zucchini is in the right foreground and pumpkins behind them.

doubting our future success. Actually our main concern was "What will we do with 300+ watermelons?" That was the yield we expected to get from our three rows.

In two of the three rows we raked the soil into hills every six feet. Into these hills we planted one row of watermelons (Sugar Baby) and one row of three kinds of pumpkins. The third row was "for us," sweet corn and green beans, planted in succession. We spread black plastic over the pumpkin and watermelon rows. Black plastic isn't especially beautiful, but it does keep the soil warm, moist and weed-free. The third row we mulched with grass clippings. The seeds germinated quickly and before very long the plastic was practically covered. The vines grew fast and long, and their territory wasn't confined to the rows. They grew across the grass towards each other, pumpkins and watermelons entwined. The pumpkins grew more energetically and their vines were longer, of course. By midsummer the garden had waves of huge green leaves floating on it. It was really a sight to see. Strangers going by would stop and look. Neighbors who had been skeptical stopped to inquire with more and more interest.

The garden was a tremendous success. We feel, actually, that we had very little to do with it. We just put things together in the right combination. After the initial preparation and planting, we did little but watched and waited. We got back from our vacation the first week in August and picked 29 vine-ripened watermelons, and they kept coming. We ate lots, gave lots away, and sold the rest locally. My aunt, a watermelon connoisseur from way back, makes watermelon pickles (from the rind). She said they were the sweetest she had ever eaten.

As I write this in mid-September the watermelons are finished, and the pumpkins are coming into their own. They look beautiful, glowing orange orbs in the sun. The corn stalks are beginning to turn brown and fallish. I should pull them out.

The other, and possibly to me, best thing about the garden was that I could always see it. In the years past, my efforts were in gardens behind the house and I couldn't see them easily. What a great reward for our labors, to stand in the living room and see a Big Max pumpkin slowly but steadily push its way from under the enormous green leaves. We thought we could see the corn grow. I planted flowers in profusion and they added color. Though I have always had a garden of some sort, small or large, this garden on the lawn brought the whole experience much closer to me. It was more than worth it, the trade of smooth green lawn for 100 watermelons, a couple of hundred pumpkins and the best sweet corn in the world.

Of course, there are improvements to be made. Next year we'll plant the melons earlier. Add another variety? Two rows? Put in pumpkins a little later. Maybe some raspberries? But we'll garden in rows on the lawn and forget the big rectangle in the back. We'll mow around the perimeter, but in a leisurely way, more for old time's sake, or to get a good look at the garden as it grows. Without realizing it, our gardening evolved into a delightful experience. Less work, more play.

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Betsy Shuman is a graduate of the horticulture program at Temple University. She lives and gardens in Bucks County, Pa.



White flowers are *Polygonella americana*

photos by Pamela Harper

*the trouble with trifids**

by Pamela Harper

***trifids** (trī´fĭds), *adj.* plants that walk



Although the author now gardens in Virginia, the plants she describes here have been discussed with local gardeners. With the exception of polygonella they are all hardy in this area.

Anemone tomentosa

In days gone by I used to listen to a science fiction radio series called *The Day of the Trifids,* trifids being plants that could walk. There are trifids in my garden. The very worst of them is the trumpet creeper *(Campsis radicans).* When I think how I yearned for that plant in the past, struggling without success to get it established in gardens in England, Connecticut and Maryland. Now, in Virginia, I cannot persuade it to leave. Bad enough that each beanlike pod contains upward of 400 flaky seeds, and that each of them germinates, but the real trouble comes from thonglike roots traveling underground. After ten years of battle with weed killer and determined digging out as weapons, the fight is not yet won, and I begin to suspect it never will be.

After a month away two wisteria bushes, tidy when I left, waved a greeting with 10 ft. tentacles, perhaps to distract attention from even longer ones stealthily snaking over the ground towards the nearest pine. Really, no southern gardener in her right mind would plant wisteria. I've known one family that moved to escape from it; it was not even their own but one in a neighbor's garden. I've almost been driven out by my neighbor's paper mulberry *(Broussonetia papyrifera).* It grows 50 ft. from our fence, but yellow thonglike roots spread out like a subway

continued



Chelidonium majus

system, throwing up new trees whenever they get the chance. The only remedy I can think of is to sneak over the fence after dark and help that tree meet an accident. If the neighbors retaliate against my wild cherry trees *(Prunus serotina)* I shall not complain; each spring, I weed out thousands of seedlings. *I* know why George Washington chopped down that cherry tree.

Several years ago I was given the double form of celandine *(Chelidonium majus)*. "It is rampant, but you won't want to part with it," said the donor. It is, and I don't, but I must, or yield to it the whole garden. It is a lovely thing, related to the desirable celandine poppy *(Stylophorum diphyllum)* and with similar glaucous leaves, but it multiplies with much the same rapidity as aphids. Because it flowers all through summer, deadheading isn't practicable; it would take several hours every day. Most double flowers don't self-seed to the nuisance point but this one is an exception. I recommend it, single or double, but only when it can have a whole semi-shaded woods to itself, not in a garden.

It is a lovely thing, related to the desirable celandine poppy *(Stylophorum diphyllum)* and with similar glaucous leaves, but it multiplies with much the same rapidity as aphids.

It took me a while to identify as *Agastache foeniculum* or anise-hyssop a plant given me as licorice plant. To me the scent from crushed leaves is definitely that of licorice, reminiscent of childhood and the Pontefract cakes (discs of licorice) and licorice shoelaces in the village store, side by side with three-cornered paper bags filled with sherbert powder to be sucked up through a licorice "straw." *Agastache* is not a flamboyant plant but every photographer should have one in the garden for the sake of the bees and butterflies that crowd the spires of lavender labiate flowers for many weeks in late summer and autumn. Having *one* in the garden is, however, not easy to accomplish, for once it has flowered there will be widely scattered progeny unless daily attention is paid to deadheading.

If some of the hours spent weeding result from well meant gifts of friends, I have no one but myself to blame for *Anemone tomentosa*, which is sold as *A. vitifolia* 'Robustissima.' I paid good money for that, and I'm not – quite – sorry. I am, however, preparing myself for the day when we may have to part. I can't say I wasn't warned: "It will colonize large areas fairly quickly," writes Graham Thomas in *Perennial Garden Plants*. In our area substitute "very" for "fairly." Japanese anemones don't, by and large, much appreciate hot summers, but 90°F for week after week troubles this one not at all. It flowers a bit earlier than the others, the flowers a dusky pink, and I am fond of it for all its willful ways.



Nierembergia rivularis

If I might be permitted a little self-plagiarism, I once wrote: "A favorite for late summer bloom is garlic chives, *Allium tuberosum,* bearing white doilies of small, fragrant stars on sturdy, 18-in. stems. But don't let this plant go to seed lest scallion turn rapscallion, distributing its progeny all over the garden." Do as I say, not as I do, for I failed to take my own advice and am now paying the price.

ivy on the walls and other bothers

Came a pause in the weeding and a coffee break, during which I perused *Green Scene,* reading ruefully Amalie Ascher's remarks about ivy on house walls. She is absolutely right, but I've planted ivy against this house – how else to conceal an over-abundance of red brick? Not the common English (or Irish) ivy, however, but smaller leaved, somewhat less busy kinds. Just the same, after a slow start, they are making rapid headway. As I pass by I tug away a few strands to delay the time when the house will be engulfed. Perhaps we'll have moved by then.

Anita Kistler, a West Chester, Pa. friend, who concurs with the hardiness of the above-mentioned trifids in her area, says she finds *Nierembergia rivularis* hard to find and hard to keep, except in a protected spot in her rock garden. I find it hard to get rid of. So lovely it is, with inch-wide saucers of unbesmirched white hovering over running mats of small, soft green, paddle-shaped leaves. Through reluctant to part with it entirely I did, last year, reduce to a one-foot patch what had been many yards. Now it covers yards again, and a bit that got transplanted along with some bulbs has started another take-over bid in a different part of the garden.

Toad lily, *Tricyrtis hirta,* has bright green, felted pixie-ear leaves in two even rows, in much the same way as 'Erecta' ivy, save that at the base they enfold the sturdily upright, velvety two-foot stems. Attractive all season, it is a real attention getter when, in autumn, it bears in the leaf axils and at stem tips flowers, usually clustered in twos or threes, not unlike a scaled-down passion flower *(Passiflora caerulea),* the

stamens and split pistil held like spokes of a wheel raised on a column over the ring of petals, the color scheme being palest mauve mottled with purple. In the spring after its first flowering I thought the reemerging plant, modestly stoloniferous and now multi-stalked, was about to be engulfed by a ground-concealing carpet of crab grass seedlings, but these turned out to be infant toad lilies. I have it facing east in a slightly raised bed under tall pines abutting the gravel drive. As I write there must be a thousand of these little plants jostling each other for living space. They do seem to stay close together and have not, so far, popped up in the furthest reaches of the garden.

Polygonum (knotweed) and *Polygonatum* (Solomon's seal) are well known to most gardeners, in one or another of their ramifications, but few know *Polygonella*. *Hortus* says there are nine species "similar in appearance and of little horticultural value." I think otherwise, and so did Caroline Dormon who, in *Flowers Native to the Deep South,* recently reissued, wrote: "*Polygonella americana* might well be called 'snow-flower,' because from late summer till fall it covers sand hills with airy masses of snowy bloom. It is a low shrub, which blooms better if treated as a woody perennial and cut back almost to the ground after flowering. The plant somewhat resembles a little, much-branched juniper but in late summer becomes a fluffy ball of snow. The tiny white flowers, rarely light pink, are charming when cut. It blooms when only 6 in. high and seldom attains a height of more than 2 ft. It grows easily from seed, blooming the first year. In deep sand, on hill sides, from Missouri to Georgia and Texas." Thomas Butcher, associate director of the Henry Foundation in Gladwyne, Pa., says it would be a plant well worth experimenting with and adapting to northern gardens. He feels it is important to assure good drainage since excessive moisture in the root zone in winter causes damage. If you'd like to make up your own mind you'll be glad to know that there is now a mail-order nursery specializing in southeastern native plants (Woodlanders, 1128 Colleton Avenue, Aiken, SC 29801. List 50¢). All plants are nursery propagated, not collected in the wild, so you may sometimes have to wait while stock is built up. My *Polygonella*, with only winter-damaged stems cut out, is a little over 2 ft. high, an upright bush of blue-gray, zigzag stems clad in needle-like leaves. The flowers are white fading to pink. I can testify to the ease with which it grows from seed, for, in going out to measure it, I counted 19 little bushlets about 4 in. high. Will it become a trifid? Not, anyway, if Caroline Dormon's suggestions are followed, and it seems it could be grown as an annual in areas where it is not winter hardy. Here, in sun and enriched sand, it has survived 5°F.

Should you deliberately plant these trifids? In my opinion black cherry and paper mulberry are always more trouble than they are worth. The others have garden value provided it is understood that they are not labor-saving plants and that their exuberance must be kept in check by frequent pruning and deadheading. Although those with invasive roots will spread less rapidly on clay than on sand, the less rampant, larger-flowered hybrid trumpet vine 'Mme. Galen' would be a better choice than *Campsis radicans,* and if space is limited there are Japanese anemones in white or pink with non-invasive roots.

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For the last 25 years, Pamela Harper has been growing and photographing plants as well as lecturing and writing about them. She was guest editor of the *Brooklyn Botanic Garden Handbook on Flowering Shrubs* (published in 1981) and a contributor to several others. Her articles and photographs have appeared in more than 30 books and magazines including *American Horticulturist, Horticulture, Flower & Garden, Avant Gardener, Pacific Horticulture, New York Times, Time-Life,* and Ortho books. Her Harper Horticultural Slide Library contains 50,000 35mm slides and is the country's largest commercial collection of plant and garden pictures.



Allium tuberosum



photo by Francis Rackemann

Clivia miniata

Clivia, A Glamorous House Plant

by Adelaide C. Rackemann



photo by Adelaide Rackemann

Clivia in bud

Of all the house plants I know, with the possible exception of orchids, I find clivia to be the most strikingly beautiful. With its great cluster of orange flowers, small trumpets triumphant against sloping, glossy green leaves, broad and strap-like, clivia is a dramatic sight.

This subtropical plant was named for the Clive family – Clive of India. A member of the Amaryllidaceae, it is even easier to grow than the comparatively undemanding and more popularly grown amaryllis. It is commonly called the Kafir lily.

While the most widely cultivated species is *Clivia miniata,* there are at least three other species, all originally from South Africa. *Clivia nobilis,* or greentip Kafir lily, was discovered in 1828, a species with scarlet umbels, tipped with green, and some 50 or 60 on a scape. *Clivia gardeni,* a native of Natal, named after Captain Garden who found it in 1855, has leaves two feet long, with green-tipped red-orange flowers. *Clivia cyrtanithiflora* is a hybrid between *Clivia miniata* and *Clivia nobilis,* intermediate in size between the two parents.

Of *Clivia miniata* itself there are many varieties, the common one having orange-red flowers, yellowish inside. But both "flava" and "citrina" have yellow flowers. These varieties, stars at the Philadelphia Flower Show, are almost impossible to come by commercially. If you are fortunate enough to find one, consider it a treasure.

My own *Clivia miniata* has the characteristic two opposing rows of dark green leaves, each leaf about 12 inches long and an inch wide, falling gracefully as they set off the thick stem bearing 10 to 18 umbels. Outside of daily misting, once-a-week watering, fertilizing about once a month, and repotting every five years – or whenever the fleshy roots rise too far above the soil's surface – my clivia needs no attention. It first bloomed during mid-February, three years after I bought a small plant. Although it can be propagated by seed, a somewhat easier method is to divide the clumps formed on older plants. Clivia can go for five years or more without being repotted. If the fleshy roots are almost jumping out of the pot, as they often seem to, then it should go into a larger pot, be given fresh soil and fertilizer (preferably liquid). If it is to be divided, which is the easier way to propagate clivia, take a rooted offshoot and cut carefully so there are enough fleshy roots for the new plant. That should be done after the clivia has finished blooming in the spring. Clivia has an imperfect bulb, consisting of leaf bases and strong fibrous roots. I suggest potting in one part compost, two parts loam and one part perlite, vermiculite or sand. A little bone meal may also be added to the soil but is not essential.



photo by Adelaide Rackemann

From November through December put the plant in a frost-free location and withhold fertilizer and water (give it enough water only to keep the soil from becoming brick dry). This rest period is the key to producing good bloom on the clivia.

Since Natal and the Transvaal are its native habitat, it is not winter hardy in this latitude. In England it is grown widely in large pots in garden rooms. In North America it is grown mainly in greenhouses, conservatories and well-lit areas of cool houses.

My clivia thrives in a greenhouse where the nighttime temperature is rarely over 55°F – an important consideration in these times of cooler houses. It needs a fair amount of sun – although in South Africa it is cultivated in shady places – and in our greenhouse, now lined with plastic to improve insulation, there is somewhat less light than is needed for cattlyea orchids to bloom. So the demands of the Kafir lily are slight.

Spectacular blooms are succeeded by red berries. Even when the clivia is not in bloom, its luxuriant leaves provide a comely background for other house plants. It is, in every sense, a glamorous house plant.

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Adelaide C. Rackemann is a free-lance writer who likes plants. She serves on the boards of Cylburn Park and the Horticultural Society of Maryland.

Natural Beauty Aids



by Jan Riemer

If you'd like to pamper yourself without the fear of using lotions and creams that contain harsh chemical additives, then you might concoct your own beauty aids from your garden. Almost any organically raised vegetable, herb, fruit or flower will provide some of the ingredients that make it fun to indulge yourself.

General maintenance and conditioning can begin with a carrot mask. Select several fresh carrots and cook in a little water until just tender. Puree them, adding enough of the water in which they were cooked, to make a fairly thick mask. Apply this over a warmly cleansed face and neck for 20 minutes, three times a week allowing the pores to absorb the vitamin A content that helps eliminate a dry and scaly skin.

For a more concentrated freshness and a glow, and to correct unsightly skin blotches and pigment spots, peel, slice and boil cucumber in a little water. Then mash and stain to make a soothing liquid. Gently pat on the face and relax for a quarter of an hour. If this is too time consuming, just rub cucumber skins on the neck and face in an upward motion. I learned this from my grandmother who had a youthful complexion well into her 80s. And now we have the added advantage of freezing the surplus skins for winter use.

If your problem is an oily condition or acne, control it by gently dabbing the area with a cottom ball dipped into a tea of steeped and strained parsley or comfrey leaves. For best results, apply it several times daily.

A wedge of tomato gently rubbed over the face acts as both a mask or skin refresher. When used on a daily basis, it reportedly bleaches liver spots that sometimes develop with advancing age.

For shiny pupils and sparkling eyes, find a comfortable place to recline, then place a used herbal tea bag over each closed eyelid for 20 minutes. Or to freshen tired eyes, place a teaspoon of dried marigold petals in a cup of boiling water. After straining and cooling, dip a cotton pad into the mixture. Squeeze out the excess liquid and place a pad over each eyelid for ten minutes.

a garden bath

Scented herbal baths are a joy. Depending on the herb, they can relax muscles and soothe joints, stimulate action in the pores or in some cases act as a healing agent.

One way to prepare the herbal bath is to place dried herbs in a small cheesecloth bag and hang under the running spigot allowing the essences to permeate the tepid bath water. Herbs used either separately or in combination for relaxing include catnip, chamomile, jasmine, lime flowers, and vervain. Basil, bay, fennel, lavender, lemon verbena, lovage, mint, pine, rosemary and thyme stimulate the circulation while mint, sage and nettle are suggested for an astringent. Externally healing herbs would include comfrey to rejuvenate aging skin (see *Green Scene,* March 1980 and September 1980), marigold to soothe minor cuts, mint for a skin bracing astringent that soothes and softens, and yarrow, which causes the pores to dilate, thus relieving fever symptoms.

To ease stiff muscles and joints add a tea of sage and strawberry leaves to the bath and get the circulation moving with a luffa gourd rubdown. (See *Green Scene,* March 1978.)

If it's just pure pleasure and a glorious afterglow that appeals to you, a fragrant bath of equal parts of rose petals, lavender leaves, rosemary and rose geranium leaves mixed together while you leisurely soak for 20 minutes will promise a luxurious finale.

hair coloring

Many of us greet the first grey hair with an exclamation of dismay. If you don't like shades of grey or white, a tea made from boiling black walnut skins reportedly covers the grey with a soft brown color. Onion skins prepared in the same way will add a red cast, or the two combined will bring out highlights.

Although a natural henna dye won't alleviate the grey, it too emphasizes the positive. Herbs can also be used to condition and gently lighten the hair. Chamomile has a component called azulene that acts on natural color to lighten and brighten as it conditions the hair. Brew one-quarter cup of chamomile flowers (they look like miniature daisies) in about two cups of hot water. Let stand until cool. After shampooing, rinse the hair with water and then massage the tea into the hair. Sit in a sunny window or out in the sun until the desired shade is reached. A tea made from sage leaves will darken the hair, while a rinse made from rosemary leaves will call forth hair highlights.

A captivating old-fashioned shampoo can be made by slowly steeping a quart of filtered rain water sprinkled with one-quarter cup of rosemary and thyme leaves for 20 minutes. Strain and add one-eighth ounce of castile soap until it melts. The shampoo can be followed by a hair rinse made of raspberry leaves that have also been steeped, strained and cooled. Any of the unused tea may be stored in the freezer for future use.

As a final cleanser and conditioner, a substitute for ineffective and commercial mouthwashes can be replaced with the following delicious concoction: two cups of water, two teaspoons each of dried rosemary and parsley, four teaspoons of dried mint leaves. Mix all together, bring to a boil, steep ten minutes, strain, cool and refrigerate until ready to use.

Beautiful skin, of course, can't be managed from the outside alone. True beauty and health come from eating the proper balance of foods, but external care for our bodies' largest organ, the skin, is also necessary to keep the million pores cleansed. Most of us feel better when we look good; so shall we borrow some of nature's abundant gifts to us?

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Jan Riemer's garden supplies most of the herbs and vegetables mentioned here. She has used them for the concoctions described in the article.

Oxalis hedysroides rubra



photo by Dr. A. B. Graf

THE FIRE FERN:
The Deepest, Richest All-over Red

by Devon Reay

The fire fern, red oxalis, is not your ordinary indoor plant, perfectly still hour after hour, week after week; at certain times it is a plant of motion. Even if you have been watching, on and off, for this phenomenon, when you actually see the center leaflet of one of its trifoliate red leaves shift, it gives you a start.

When I moved my red oxalis, I disturbed its foliage. In one sudden, all-over motion it shuddered, rearranging every leaf neatly. Made me think of the TV character Carlton (of the Rhoda show) urging his inert dog to "play alive," except the dog didn't and the fire fern did.

Except for its dainty pure-yellow flowers, the fire fern is entirely red, a rich, deep red more beautiful than the most colorful young red maple. When the earliest rays of the morning sun illuminate its foliage, high on a southeast sill, the sight is memorable. Unlike the common wild oxalis, which has heart-shape leaflets, each fire fern leaf consists of three delicate ovate leaflets. And the compact plant, which bears dozens of bright blossoms several times a year, generally remains less than six inches high.

The more light the plant receives, the deeper its red; the more moisture, the healthier it appears. It does best where the temperature is between 61° and 75°F and, like all plants, it must have fresh air. In winter or early spring, when the outside temperature is above 64°F, you can set your fire fern in a sheltered spot outdoors and leave it until the temperature begins to cool. Or you can open the window where the plants stand, so only the storm window is between them and outdoors, unless the outside temperature is below 50°F. This provides extra space and a bit of fresh air.

The fire fern thrives in a mixture of two parts sand and one part compost or humus, or sandy loam, in a clay pot. If there is room, two plants can be put in one pot. A pebble mulch benefits the plant; it retains moisture and slows evaporation just below the soil surface. Wilson Bros.* sells this choice foliage plant and they advise keeping the soil moist; that is not easy since inside air during the cold months is much drier than outdoor air. You can fit a small clamshell among the mulch pebbles and keep it filled with water, providing humidity where most needed. Naturally the shell is placed so it tips slightly inward, toward the plant's stem. "Set the plants on shallow pans filled with moist, coarse gravel," Wilson suggests. "Never let the pots stand in water."

No plant should ever be allowed to become completely dry; during a long drought you can easily lose a fire fern summering among the perennials, even though you watered it now and then. When you water, soak the entire plant, particularly its roots.

About every four weeks, during spring and summer, the fire fern can be set in a container of diluted fish fertilizer, one half teaspoon per quart of water, so that two-thirds or three-quarters of the clay pot is immersed. After ten minutes, gently lift the plant and drain into another plant.

And a teaspoon of Jersey green sand ** can be added to the soil in which your fire fern grows; it helps hold moisture at the plant's roots.

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Devon Reay is a Maryland gardener whose major horticultural interest is pines. She grows them and enjoys researching the subject.

*Wilson Brothers, Floral Co., Inc., Roachdale, Ind. 46172.

** Zook & Ranck, Gap, Pa. 17527

AN INSTANT GARDEN MATURES

by Alexandra Basinski

When we bought our Manayunk rowhouse, our first priority was to make an extra "room" out of our small (15-ft. 9-in. wide x 18 ft. deep) yard. Sam Unger, a friend who is a landscape architect, offered to design Basinski Gardens and we took him up on the offer. Our idea was to create an "instant garden," something that would grow quickly and would not require a lot of maintenance.

The first step was to try to squeeze a cornucopia of plants into Sam's design. I quickly chose plants that I had been familiar with at the farm where I grew up. Once we agreed on the design, the scale of the yard dictated planting the perimeter first. In all, we planted a hedgerow of nine ibolium privets, one clump of three 'October Glory' red maples, two white flowering dogwoods, eight Siberian red-twig dogwood shrubs, two shrubs of Carolina silverbell, day lilies, and dwarf creeping iris. We scheduled for the next fall two Japanese flowering crab apples, nine Bar Harbor junipers, some ornamental grasses, hay scented ferns, and periwinkle. From the schedule, only the periwinkle made it into the garden.

Spring arrived and the plants that had fit so perfectly into our design the previous fall had begun to grow. Along with our trees, our horticultural knowledge was expanding. We discovered some features in this new environment that we hadn't anticipated. When the clump of "red" maple trees in the corner began to turn green, I found that the trees we hoped would carry red leaves all season turned scarlet only in the fall.

Lesson number one: the term "red maple trees" won't tell a designer or nurseryman for how long you want the color. I hadn't specified which type of red maples I wanted so our designer assumed I had no preference. *Acer palmatum* (Japanese maple) is what I wanted, not an *Acer rubrum* 'October Glory' red maple. As the "red maples" became greener, so did the rest of the trees and flowers, and at a delightfully brisk pace. The jungle effect had taken hold so well that we opted to put the second planting off for a season or two. We were beginning to run out of space and were interested in seeing just how our jungle room would take shape.

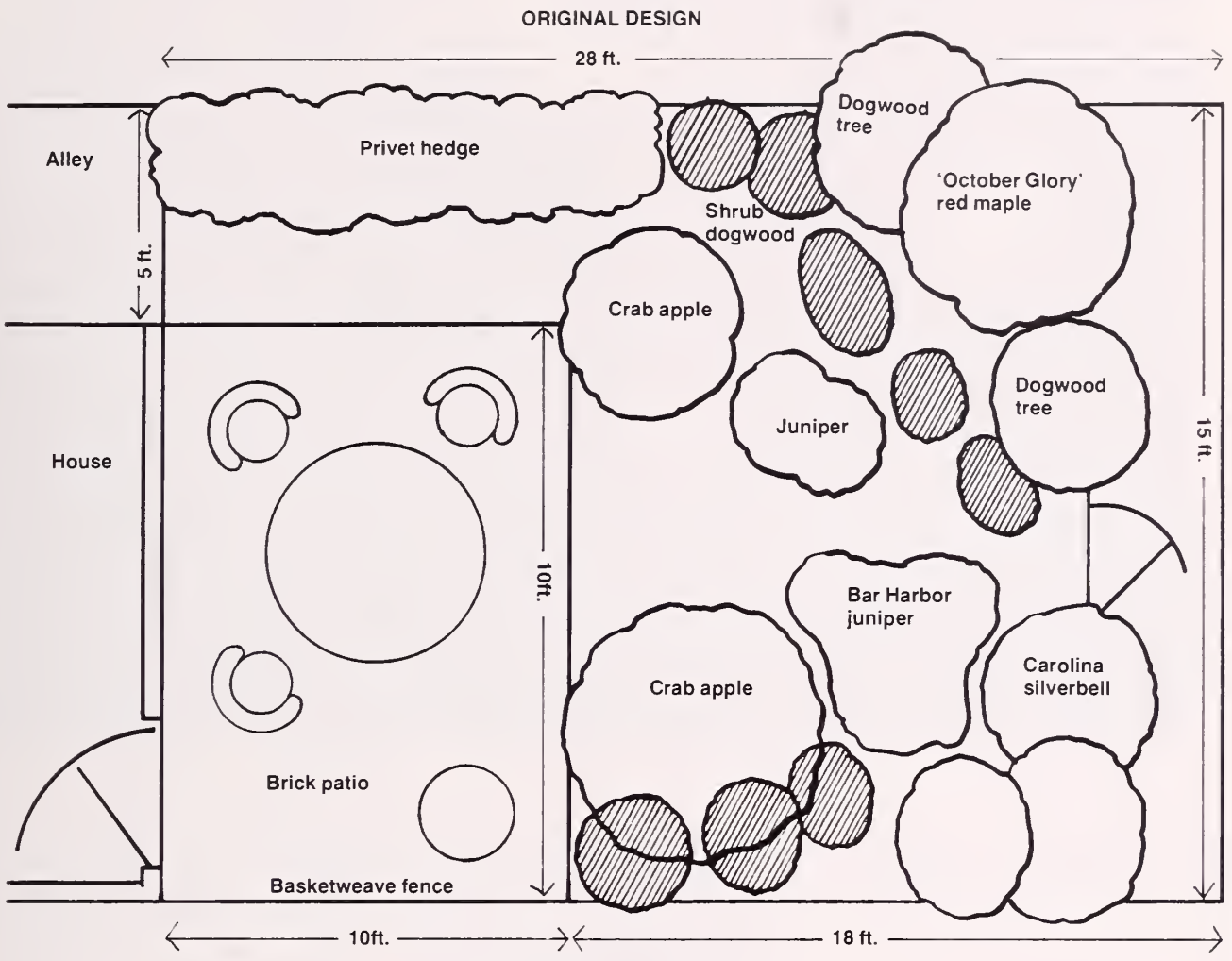
In the fall of 1979, our garden's first anniversary, I began to take courses at the Arboretum of the Barnes Foundation. I wanted to learn as much as possible about outdoor gardening and had a perfect lab in my own yard. I had begun to realize that some of the trees I had admired in the open country might not adapt to city conditions and might not fit into our small space. The red-twig shrub dogwoods, low spreaders, had really taken off. I was pruning them so often to keep them in bounds that my husband nicknamed me "Zorro." I have since removed all but two, and assorted annuals, perennials, and house plants are filling in the spaces. The white flowering dogwoods subsequently succumbed to borers and a new peach tree has added a vertical dimension to the design.

The red-twig shrub dogwoods, low spreaders, had really taken off. I was pruning them so often to keep them in bounds that my husband nicknamed me "Zorro."

The red maples have not grown as quickly as one might expect, possibly because they are grouped together in a corner. They form part of a delicate frame for the ferns and snapdragons growing from pockets in the 10-ft. high Wissahickon schist retaining wall at the rear of our property. Pine bark mulch and periwinkle have been combined to form a simple floor.

Three years of rearranging our instant jungle room have given me some insights into design for small spaces that I will be able to use in a variety of landscape situations. I learned that trying to change the natural growing habits of plants is, at minimum, time-consuming

continued



Original Plants

1 *Acer rubrum* 'October Glory'
'October Glory' red maple

2 *Malus floribunda*
Japanese flowering crab apple

2 *Cornus florida*
white flowering dogwood

3 *Halesia carolina*
Carolina silverbell

8 *Cornus alba* 'Sibirica'
Siberian dogwood (shrub dogwood)

9 *Ligustrum ibolium*
ibolium privet

9 *Juniperus horizontalis* 'Bar Harbor'
'Bar Harbor' juniper

8 clumps day lilies

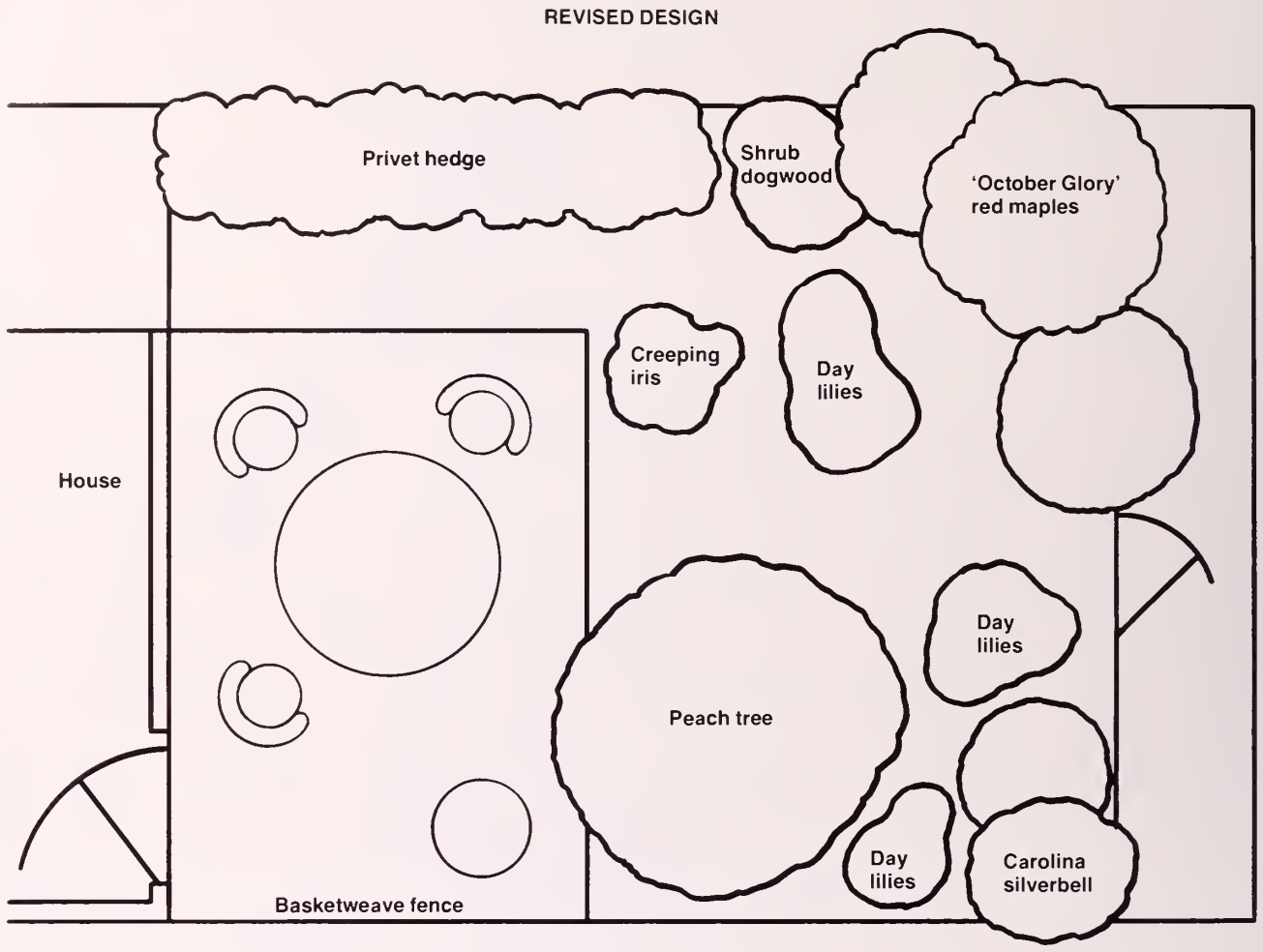
30 hay scented ferns

6 *Iris cristata*
dwarf creeping iris

assorted ornamental grasses

Vinca minor
blue flowering periwinkle

See revised plan on next page.



Revised Current Plants

3 clumps *Acer rubrum* 'October Glory'
'October Glory' red maple

2 clumps *Halesia carolina*
Carolina silverbell

3 clumps *Cornus alba* 'Sibirica'
Siberian dogwood (shrub dogwood)

9 clumps *Ligustrum ibolium*
ibolium privet

1 peach tree – semi-dwarf

3 clumps day lilies

2 clumps *Iris cristata*
dwarf creeping iris

1 clump *Pennisetum*
rose fountain grass

2 bleeding heart

assorted daffodils

assorted crocus

Vinca minor
blue flowering periwinkle

assorted annuals

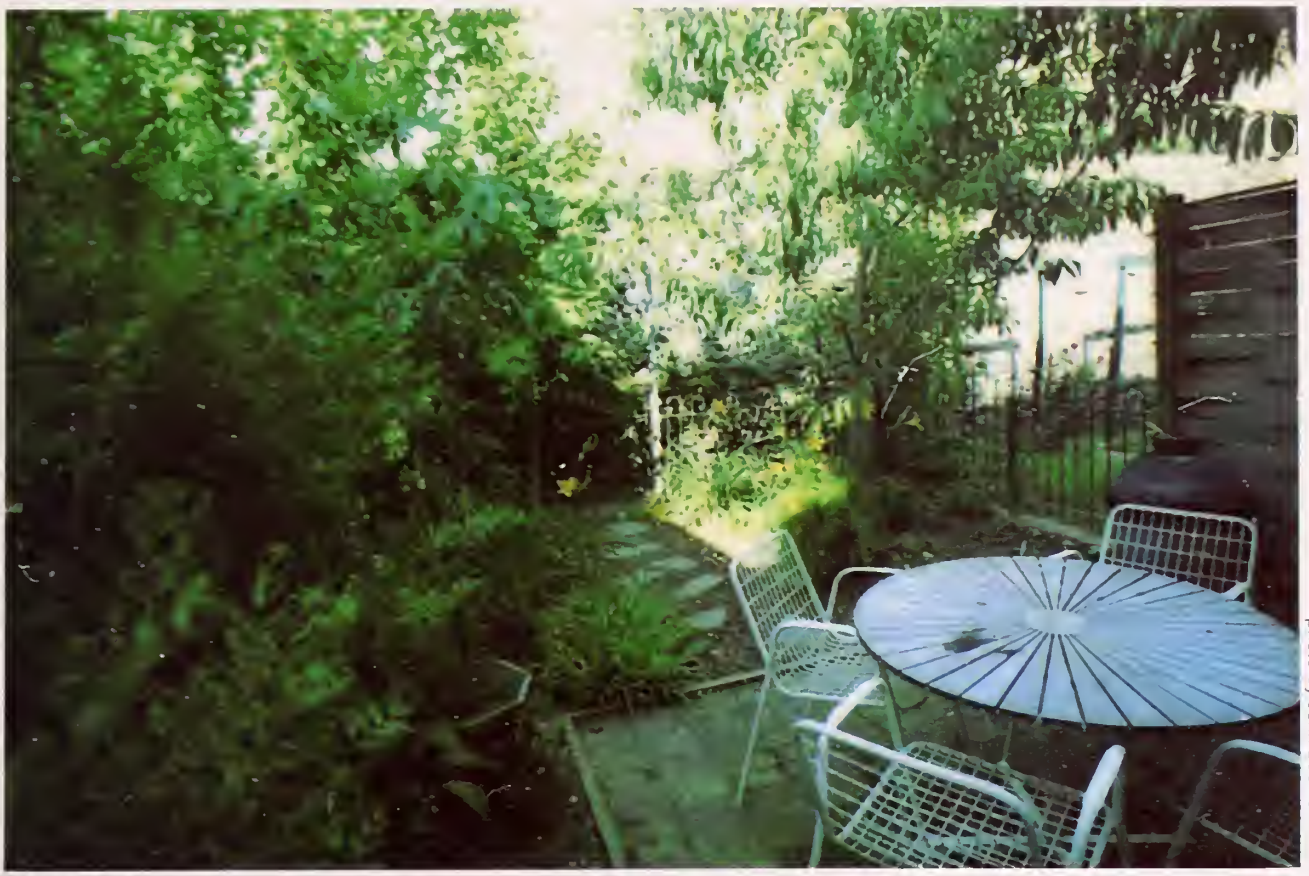


photo by John Basinski

The Basinski instant garden has matured since its inception three years ago. Photo taken from position of the house on the drawing at left.

and often unsuccessful. It is also expensive. The next time I will choose plants to fit location and purpose. The 'October Glory' red maples we planted will outgrow their corner before long. We will have to replace them with smaller, slower growing varieties such as Japanese red maple, Kousa dogwood, or Japanese stewartia.

I found that our overall design was a useful reference, but planting in stages allowed me time for reflection and refinement as the plan progressed. Our "instant" design provided horticultural privacy in our small yard quickly while allowing us to experiment with plants.

Our Instant Garden has happily made the transition from something to enjoy for a year or two to a permanent source of pleasure.

●

Alexandra Basinski is a district coordinator for PHS's Philadelphia Green Program.

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I certify that the statements made by me above are correct and complete.
Jean Byrne, Editor

the plant finder – A free service for *Green Scene* readers



If you can't locate a much wanted plant send your name and address (include zip), the botanical and common name of the plant to Plant Finder, Green Scene, PHS, 325 Walnut St., Philadelphia, PA 19106. People who have the plants or seeds you want will contact you to make arrangements about selling or giving them away, mailing, etc.

WANTED

***Fraxinus excelsior* 'Aurea' or 'Jaspidea.'** Looking for an American source.
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Corydalis bulbosa – Fumewort syn. ***C. cava***
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▼

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▼

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▼

Pinus monophylla
Contact: Patrick J. Fremder, 2139 Berrell Ave., Abington, PA 19001

Letters to the Editor

Photos

I was very pleased with Barbara Bruno's article in the September issue of the *Green Scene* on photographing flowers.

A point that might be of interest to photographic beginners using the popular through-the-lens (SLR) 35 mm camera: Be sure to increase the exposure by one or two F stops [that means go to a lower F stop number, which will open the lens wider] from what the meter in the camera indicates as correct when shooting backlit flowers (or any backlit subject, for that matter). The stronger the backlighting, the more you must increase the exposure to compensate. If you don't do this, the backlit object will be underexposed, and will appear too dark in the final print or slide.

One simple way of getting the right exposure is to point the camera down at the unlit ground just in front of the sunlit flower and use that exposure reading for the actual shot. As you raise the camera and focus on the flower, the meter needle should rise a stop or two. Ignore that rise and shoot with the setting made when the camera was pointed toward the ground.

If the camera is fully automatic, there should be an override mechanism that will serve the same purpose, that is, will increase the exposure by a stop or two if you activate the right lever, button, or whatever.

In as much as this article is for beginners, I will not comment on using spot or incident meters for difficult lighting situations.

Keep up the good work!

Samuel M. Felton, Jr.
Evanston, Illinois

More and Better Plants

I am thoroughly dismayed and frustrated with the almost total lack of initiative (or knowledge) in making more use of many plants available to us, not only to widen our selection of choices but to replace wrong uses of plants now available. For instance, recently at a local mall I saw slaughtered mounds of pyracantha with never a berry possible fashioned like so many California privets sheared to the ultimate. Don't nurserymen know about *Taxus baccata* 'Repandens,' one of the many dwarf forms of *Ilex crenata,* or of the evergreen barberries?

Certainly many nurserymen are acquainted with lovely stewartia, oxydendrum and franklinia. Why not talk them up and make them more available? Why not more exposure of *Pinus cembra, Sciadopytus cavidiana* occasionally instead of pyracantha? What about the adaptable Hinckі cypress instead of the insect plagued hemlock? And I know personally some rarely discussed ground covers and perennials that would enrich many a garden.

Over the years, working with Frank Styer I learned to appreciate his willingness to offer new introductions, which are now much used in the trade.

The J. Franklin Styer Award of Garden Merit* is a fine push in the right direction. I hate to believe we are satisfied with only the plants we are now using. What about it, dear readers, does this make sense to you?

Thompson V. Palmer
West Chester, Pa.

*Brochure about the award is available from PHS.

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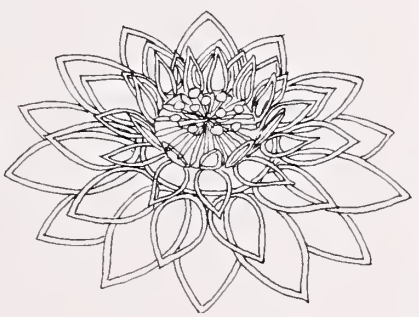
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GLASS FLOWER ART by Lauralou C. Bates. We've had a request for information on how to create the glass flowers that Lauralou Bates wrote about in the November issue of *Green Scene,* pages 21-23. Ms. Bates has graciously prepared a worksheet outlining her procedures. We will be happy to mail a copy of the outline on request. Write: Glass Flower Art, *Green Scene,* Pennsylvania Horticultural Society, 325 Walnut Street, Philadelphia, PA 19106. Include a stamped, self-addressed envelope.

Advertising copy should be submitted 8 weeks before issue date: November, January, March, May, July, September. Minimum rate $10. Charges based on $3.00 per line. Less 10% discount for two or more consecutive issues, using same copy. All copy should be accompanied by check made out to PENNSYLVANIA HORTICULTURAL SOCIETY and sent to Lisa Stephano, GREEN SCENE, 325 Walnut Street, Philadelphia, PA 19106.



Plants help create a sense of community. See page 7.



THE green scene

HORTICULTURE IN THE DELAWARE VALLEY
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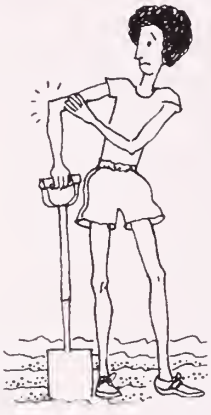
Primula abchasica in March at Winterthur.
See page 17.

THE
green scene
HORTICULTURE IN THE DELAWARE VALLEY


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Back Cover: photo by Edmund B Gilchrist, Jr

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After a Long Absence the Fringed Gentian Returns to Winterthur

"Thou waitest late, and comest alone, When woods are bare and birds have flown
And frost and shortening days portend, The aged year is at his end."

William Cullen Bryant, "To a Fringed Gentian"

by Richard J. Both

The *Gentianopsis crinita* or fringed gentian pictured here bloomed at the Winterthur Museum Gardens in Octoer, 1981. It wasn't easy and just didn't happen by chance, but was carefully planned to determine if it could be reestablished in areas where it was known to grow in the late 1800s.

Gentians exist in most parts of the world. The genus is named for King Gentius of Illyria who lived in 2 BC, and who is credited with faith in the medicinal value of the bitter plants growing in the area now called Yugoslavia, along the Adriatic Coast. The fringed gentian is native to North America, having a range from Maine to Manitoba and south to Georgia but is rarely seen and has become extinct in many areas. It so happens that this fringed gentian is the least reliable of the American species and a sad victim of civilization. A true biennial, it takes two years to bloom, then dies. It can't be dug in the wild or it will surely die, and if a field is mowed before the bloom sets seed, the plant has no way to reproduce. Thus, it is only found in that rare old field or meadow that hasn't been cut for years or has been graced with livestock. The area where they once grew at Winterthur was turned into a pasture for Mr. du Pont's prize Holsteins and the gentians soon disappeared. Now that the herd of cows has been disposed of, the Gardens Division is developing a beautiful wildflower meadow. We hope that after three or four years of introducing small seedlings into the meadow, they will establish themselves. The question is – will they?

How did all this get started? Some years ago, I saw a picture of this plant and admired its beauty. I took the wildflower course at Longwood and found that they not only didn't grow it, they stated it was next to impossible to grow. That was all I needed. I read all I could find and remembered a writer who said that it was not only the finest blue in nature, it was so beautiful and interesting that it repaid one the trouble to grow it, and even if it was difficult to succeed with, it was worth the effort.

It so happens that this fringed gentian is the least reliable of the American species and a sad victim of civilization. A true biennial, it takes two years to bloom, then dies. It can't be dug in the wild or it will surely die, and if a field is mowed before the bloom sets seed, the plant has no way to reproduce.

Not being able to find any seed offered by dealers, I kept asking people if they had ever seen them in the wild. Finally, one dear friend told me, in confidence, of a possible source in Chester County, and I was off and running. The first few seeds were collected in early November 1979.

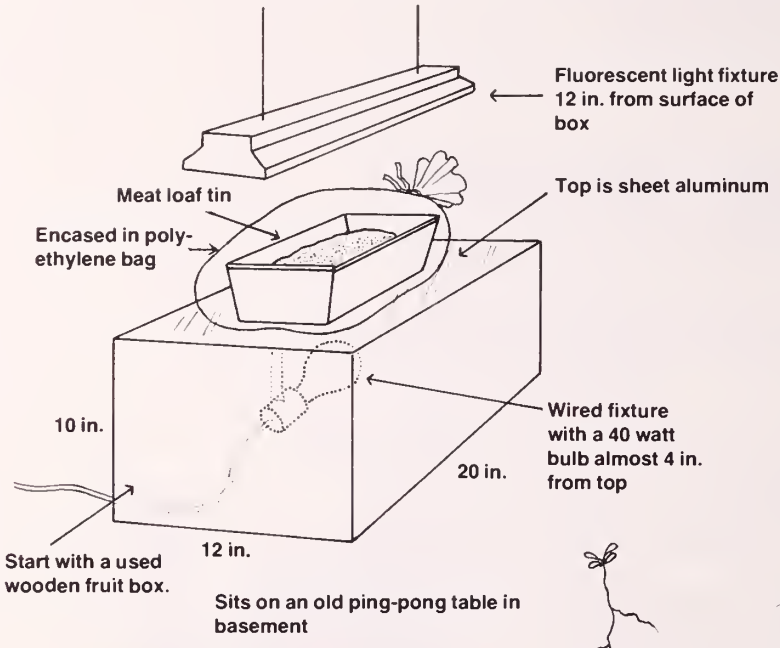
I took only one of the many seed pods from each plant, being careful to leave the other pods for continuing propaga-

continued



Fringed Gentian

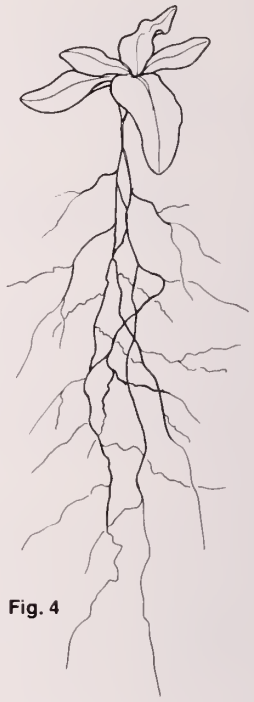
continued



Propagating Unit for Gentian Seeds
Fig. 1


Fig. 2


Fig. 3


Fig. 4

½ size plant drawings by Jane Scott

tion. I put it in a polyethylene sandwich bag with moist, milled sphagnum moss. This was put in an old non-defrost type refrigerator at 45°F for three months. In mid-February 1980, I broke open the pod and scattered a few of the infinitesimal seeds on the surface of moist Terralite, contained in a 3 in. x 6 in. x 2 in. aluminum meatloaf pan with holes punched in the bottom. The seeds, which were then invisible, were lightly pressed into the surface and the whole pan placed in a clear polyethylene bag and sealed.

The enclosed container was then given bottom heat of 70°F (see figure 1) and within two weeks tiny specks appeared on the surface. After the seedlings had four leaves, they were still only ¼ in. rosettes, but the roots were 3 in. long (see figure 2). These small rosettes were carefully transplanted into 3-in. plastic pots containing a soil mixture of one part peat, one part compost, and one part coarse stream sand. (Caution: great care must be taken not to damage the roots.) The pots were placed on the greenhouse bench where the temperature was 70°-75°F during the day and 45°-50°F at night. By the first part of May the rosettes had grown to about 1½ in., but the roots were longer than the pot (see figure 3). At this point, the plants were ready for their permanent home.

We found a spot at Winterthur with conditions similar to the area where the seed was collected. The area is an abandoned pasture, overgrown with goldenrod and asters. The field slopes gently to the southwest and is bordered by a small stream. Soil samples taken indicate a pH of 5.6 to 6, high in magnesium, low in phosphorus, and with average amounts of potassium and calcium.

Seven plots about 10 ft. in diameter were marked out in this field, and six plants were transplanted to each plot. A small hole was dug with a hand trowel in the thick, heavy turf and the plant was gently squeezed in and firmly tamped. No care was given after this May 1980 transplant. By September 1980 the rosette had grown some, but the root structure had developed extensively. We carefully dug some up to show the figure 4 illustration. The plants wintered well, but stayed the same until July 1981 when the main stalks began to appear, and by late September blooms appeared and the picture was taken in early October.

More seed was collected in 1980 to produce more seedlings in 1981, and these have also been planted in the same plots where they bloomed. We hope that after helping these beautiful, shy plants along for several years, they will finally be able to establish themselves.

We do not have any seeds or plants for sale at the Winterthur Plant Shop, but if they become established, we may be able to sell small plants by 1984. The only place that may have some plants for sale in 1982 is the Garden In The Woods run by the New England Wildflower Society, Hemenway Road, Framingham, Massachusetts 01701. They do not ship, but a visit to this beautiful garden is well worth the trip, and per-



photos by William H. Frederick, Jr

Gentianopsis crinita photographed in October at Winterthur

haps you too can try to establish this magnificent plant in your meadow. I say meadow because it does not appreciate a cultivated garden.

As Reginald Farrer remarked: "If the gentian will thrive with you, you cannot go wrong with it; if it does not thrive, not all the king's horses nor all the king's men will induce it to do so." Good luck!



Richard Both is a greenhouse volunteer at Winterthur Museum and Gardens. He is fond of propagating wild flowers. He serves on the PHS Council and the board of the American Horticultural Society.



The author with a stand of the gentians



WEEDS AND WILLIAM DARLINGTON

by Joan Brinton

"Weeds are the most successful plants in the world; they survive everything we try to do to them." So observed Dr. William Overlease of West Chester State College.

The litany continues: *Hortus III:* "A weed is a plant not wanted, therefore to be destroyed. A plant desired under one circumstance, as horseradish or vegetable garden dandelion, may be a weed under other circumstances."

Donald Wyman warms to this subject. He lists 250 plants as weeds and devotes 11 pages of his *Encyclopedia* to weed control.

Dr. William Darlington, whose 200th birthday will be celebrated April 1982, devoted an entire book to weeds and useful plants *(Agricultural Botany of American Weeds and Useful Plants).* This native Delaware Valley Chester County resident was most eloquent in his definition: "Any homely plant which is not noticeable for the beauty of its flowers, nor entitled to respect by a reputation for medicinal or other useful qualities, is designated by the epithet *weed*." Marvelous to know that weed is a word properly termed epithet.

Weeds are always with gardeners. Even when the zinnias have turned black and the zucchini leaves have melted from stiff green to soggy brown, the docks and dandelions and the honeysuckle are still with us, the latter's last blooms perfuming the white morning world of the first hard frost. Leisure gardeners try everything, from herbicides on paved areas, to heavy mulch on vegetables, to delicate hand weeding in treasured perennial beds. Still there are weeds. This is very irritating to the gardener. But, to the farmer, weeds can be devastatingly hard on the productivity of his cultivated fields. Wyman states that before chemical weed controls were widely introduced (before World War II) weeds caused 4 billion dollars loss annually to farmers. Thistles (as weeds or flowers) have been the subject of recent *Green Scene* articles. Here is what Willliam Darlington had to say in his *Agricultural Botany* about Canadian thistle *(Cirsium arvense).* "In the case of weeds of this description, the necessity of early eradicating them is apparent, for if once established and an underground provision depot formed, the farmer and the plant are placed in the condition of besieging and besieged forces, as long as provisions hold out, the latter can maintain ground." Nothing more precisely describes my ongoing battle with Creeping Charlie *(Glechoma hederacea).* The "besieged" runs through my ajuga and vinca putting down a tenacious toehold everywhere. (*Hortus III* still says this can be used as a groundcover, though acknowledging it has become a weed in some places). Quoting Dr. Darlington again, "In Weeds, evil should be emphatically nipped in the bud. In this respect, the farmer should act in the spirit of the Western savages who kill women and children of their enemies as a tolerably sure way of preventing the multiplication of warriors." Well now, maybe if we all put on warpaint and the appropriate headdress our battles with weeds would be more successful.

"In some European countries a farmer may sue his neighbor for neglecting to destroy weeds upon his lands, or may employ people to do it at the delinquent's expense."

On the aforementioned honeysuckle that strangles trees and clogs fences in the Delaware Valley unless man and beast work to keep it in check, Dr. Darlington observes, with the kindest words, that *Lonicera granata* "along with other species of honeysuckle – [are] favorite plants for decorating arbors and porticoes. Most of them are delightfully fragrant when in flower and are much frequented by the exquisitely beautiful little hummingbird." He mentions Italian honeysuckle *L. caprifolium* and woodbine, *L. periclymenum,* but there is no mention of *Lonicera japonica,* which is listed in *Hortus III* as a "serious woodland weed in the middle Atlantic states." L. H. Bailey said in his 1916 *Cyclopedia* that it was "becoming naturalized in some areas." Obviously the imported *Lonicera japonica* came from the Orient to our shores after Dr. Darlington's era. Weeds, like fashions are either "In" or "Out" and although we might wish honeysuckle was "Out," it is very much with us.

The same is true for one of our natives, bittersweet *(Celastrus scandens),* sold at farm markets for fall decorations. It behaves in Chester County trees as if it were bent on no less than murder with its twining stranglehold. Yet when Dr. Darlington wrote his treatise on weeds he spoke of bittersweet as "one of the most elegant native climbers; . . . highly ornamental when trained upon a trellis work . . ." Why has it become such a pest?

Then there are those weeds that seem wonderful in certain places (just as *Hortus III* says). Tansy *Tanacetum vulgare)* listed by Wyman in his 250 weeds, does brighten beautifully the gravelly roadsides of New England.

When picked and hung upside down, it will dry to a burnished old gold that will light up winter dreary corners of the house. Dr. Darlington said tansy "was introduced as a garden plant and generally cultivated for its aromatic bitter properties, which have rendered it a prominent article in the popular Materia Medica (a term akin to our non-prescription drug store remedies?). He continues "it has now escaped from the gardens and is becoming naturalized, and something of a weed in some places."

I still like tansy's bright lights, weed or not. Many flowers like tansy, introduced into the U.S. either through grain seeds or imported for ornamental or medicinal plants, have become "baddies." The dandelion, whose young green leaves are delicious in salads, and whose flowers are clear yellow, interrupts the smooth green uniformity of suburban lawns with unslightly coarse rosettes. Dandelion is known to have come into this country in grain seed. Like the destructive gypsy moth, some plants, when introduced, seem more vigorous than in their native habitat.

There is a reverse flow of plants from the U.S. to other countries. The English have used our weed goldenrod to beautify in autumn the formal perennial gardens of their stately homes. William Darlington does not mention the beauty of the natives but does say that solidago is weedy on farms.

A botanist of great thoroughness (in addition to many other talents) William Darlington did not write his *Agricultural Botany* for the delight and entertainment of a gardener in a distant century. He wrote to instruct. He seriously dedicated his work "to the young farmers of the United States, this humble attempt to aid and persuade them to cultivate a department of Sciences essential to an enlightened agriculture and indispensable to an accomplished yeomanry, is respectfully dedicated by the Author." He wrote before aspiring farmers went to college to learn modern farming techniques and technology. He urged them to learn the Latin names of all the plants with which they dealt. As for weeds, despite all the knowledge now available, not much seems to have changed.

After talking about thistles he writes, "So numerous are the ways by which seeds are dispersed, that, however careful a farmer may be upon his own premises, a slovenly and neglectful neighbor may cause him infinite annoyance by furnishing his lands with an abundant supply. In some European countries a farmer may sue his neighbor for neglecting to destroy weeds upon his lands, or may employ people to do it at the delinquent's expense." And in 1981 in the September/October issue of *Green Scene,* John Philip Baumgardt wrote to the editor about "thistles": "The problem has become so serious that several states have enacted control laws; Missouri finally came up with one two years ago. It doesn't look like much, but lawyers tell me that the legal interpretation of 'every such offense' boils down to $25 per thistle."

William Overlease, whose remarks on the success of weeds opened this article, is cataloging the flora of Chester County. He finds that in addition to the foreign introductions, such as multiflora rose (a vicious upstart) and the oriental bittersweet and honeysuckles, the changes in the terrain contribute to encouraging the aggressive, tough plants. These changes include disturbed sites, forest cuts, forests burned before the day of modern fire engines, cleared land, opening large areas to sunshine, all of these have changed the habitat of our native plants. Some, such as Dutchman's breeches, a nice wildflower, not yet thought of as a weed, but uncommon in Hugh Stone's *Flora of Chester County,* published in the 40s, is now quite common. The Norway maple, which Dr. Overlease said could not withstand the fires that previously kept it down, is now seeding itself abundantly. Look for the yellow leaves in mid-November when all other trees except some oaks have dropped their leaves. Eventually the heavy shade these maples provide will eliminate the understory common in our woods now, and with that undergrowth the dogwoods might go. Should the Norway maple be considered a weed? It might be so classified if you treasure the white stars of dogwood in our spring woods.

Most Sunday gardeners will find they must continue to use hand-to-hand combat as their best defense against those unwanted plants called weeds.

The giant foxtail grass flourishes where chemicals are used to *prevent* weedy growth in cornfields and along roadsides according to Dr. Overlease, and eulalia grass, a delicate pretty plant of the moist lower slopes is the most exploding newcomer to Chester County.

So the problem of weeds has not changed much from Darlington's time, although what we consider weeds may have changed. It seems that weeds of one kind or another will always be with us.

Although farmers may now employ large-scale chemical warfare, most Sunday gardeners will find they must continue to use hand-to-hand combat as their best defense against these unwanted plants called weeds. You can still pick the pretty ones for home decoration and swear, as in epithet, at the rest. All *Green Scene* readers should share any helpful hints on weeds and weeding that they learn. Meanwhile put on your warpaint and best warbonnet and go forth to the Weed Battle.

Society to Stage Darlington Exhibit in April

We're celebrating William Darlington's 200th birthday with an exhibit of specimens from his Herbarium (on loan from West Chester State College) and specimens of plants from early Philadelphia gardens. The gardens are Bartram's and the Pierce Brothers. Also included will be samples of plants illustrated in Darlington's book *Florula Gestrica.* This early 19th century book from the library's Pennsylvania Collection will be on exhibit. Stop by in April.

The William Darlington Exhibit at PHS will run from Monday, April 5 to Friday, April 30 in the Board Room.

At West Chester State College, a William Darlington Bicentennial Observance will be held April 25-28, 1982. Five major scholars will speak about Darlington and science in his time. For information call 1-436-3453.

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When queried about biographical data, Joan Brinton, known to her friends as Toni, wrote: "I overcame my natural black thumb with good coaching from my parents Mary and Wilbur Zimmerman. I was well taught by my favorite teacher, Lois Paul; blessed with a green godmother, Sally Reath; and privileged with the constant expert counsel of my Green Guru, M. M. Brubaker. At present I work as a volunteer propagator at Winterthur Greenhouses. I also propagate unusual or rare plants with Mrs. William Sharp for the GCA Zone V Annual Meeting." Brinton also serves on the PHS Council and works at the Harvest Show and Philadelphia Flower Show.



photo courtesy of Penn State Cooperative Extension Service

Mature larva on partially chewed leaf



photo by author

Street scene showing a moderately defoliated white oak; nearby Norway maples appear untouched.



photo by author

Female gypsy moth laying egg mass



photo courtesy of Penn State Cooperative Extension Service

Several egg masses, some with individual eggs exposed, others masses covered



photo courtesy of Penn State Cooperative Extension Service

Installing a burlap apron to mechanically protect a shade tree

1982
A Big Year for the Gypsy Moth in the Delaware Valley

by James J. McKeehen

The gypsy moth *(Lymantria dispar)* is currently the most serious insect pest of shade and forest trees in Pennsylvania. Many Delaware Valley residents have begun to confront the nuisance and damage caused by gypsy moths. Those people who have been missed by the pest could well have the opportunity for a hands-on experience all too soon. The gypsy moth is here and is spreading rapidly throughout our beautiful tree-covered valley, with oaks as its number one target. In 1981, the Pennsylvania Bureau of Forestry, Department of Environmental Resources, sprayed 6,260 acres in Delaware, Chester, Montgomery, Bucks and Philadelphia counties as a part of the Commonwealth's Gypsy Moth Pest Management Program. The Bureau has received requests from these same counties to spray 78,689 acres in May of 1982, more than 12 times last year's acreage. A Bureau of Forestry official indicated that 70% to 80% of those acres do, in fact, require spraying. However justifiable, fewer acres may be sprayed due to lack of state, federal, or county funds or because some people object to spraying. Landowners in spray areas are notified of the state's spraying plans and have the right to object. If objectors are strategically located, all or a large portion of a targeted area may not be sprayed.

In the 70's the Bureau adopted a statewide policy of "learning to live with" gypsy moths. The policy included limited spraying to protect forested, residential and recreational areas and leaving the remaining 90% of the state's undeveloped forest lands to biological controls. The Bureau of Forestry uses several criteria to determine areas to be sprayed in the Delaware Valley: (1) each spray block shall be 25 acres or larger (in some cases, if there are infested areas over six acres within a mile of a 25 acre block, those small areas may also qualify for spraying; (2) the area to be sprayed shall be heavily forested (50% or more, properties with a few trees or just tree-lined streets do not qualify); (3) the gypsy moth egg mass numbers must exceed 250 per acre. This criteria excludes many urban areas, even though infested with gypsy moths. Therefore, many Delaware Valley residents will be required to cope with gypsy moths on their own.

spotting the enemy: learning its cycles

Eggs. From late July the gypsy moth rests docilely until early or mid-May in an egg cluster, averaging 400 to 600 eggs. The clusters were deposited the previous summer and are covered with velvety, buff-colored hairs from the body of the female moth, oval in shape, and one to two inches long. Egg masses are found almost anywhere, usually close to where the female larvae crawled to pupate. They may be found exposed on tree trunks or the undersides of branches, under bark or rocks, on buildings, vehicles, or rubbish. The gypsy moth has one generation per year.

Larvae. Larvae begin hatching in late April to early May, which also coincides with the development of new tender tree leaves. Hatching may continue over a period of two to four weeks, depending on placement of the egg masses and exposure to the warming sun. Soon after hatching, the young caterpillar moves to the tops of the trees or outer branches in response to light. It is at this time that they are carried by the wind to spots as far away as 20 miles. Male caterpillars go through five larval instars (development-size change stages) and the female caterpillar six instars, spending four to ten days in each instar. Caterpillars remain up in the tree on the leaves usually through the third instar, feeding during early morning and late afternoon daylight hours. During the first three instars the gypsy moth is small, feeding damage is minimal and unless the homeowner is aware, the insect may remain unnoticed. It is during this time that most homeowners mistakenly identify Eastern tent caterpillars and canker worms (inchworms) as gypsy moths. During instars four to six, most of the feeding occurs at night between sunset and sunrise. Coincident with this change in feeding behavior, the caterpillars descend the tree to rest in the ground litter or in sheltered bark crevices. When the population is heavy and overcrowded, the late instar insects are active feeders both day and night to satisfy their hunger.

Gypsy moths are more of a people problem than a tree problem.

The caterpillars feed voraciously in the last two instars and each is capable of devouring or clipping off several leaves per day. Clipping refers to the caterpillar biting off chunks of leaf and dropping it. This accounts for the large amount of small pieces of leaves on the ground associated with gypsy moth infestations. Seventy-five per cent of all foliage eaten is consumed in the last instar, which occurs from mid-June to mid-July. Stand quietly near a moderate to heavy infestation at this time and the excrement falling from the trees sounds like rain. The caterpillars are now 1½ to 2½ inches long, hairy, grayish in color, peppered with numerous small, dark spots; the head has yellow markings and three light stripes down the body. The most distinguishing characteristic is a double row of colored spots along the back, the first five pairs are blue and the remaining six pairs a brick red color. The caterpillar stage lasts about eight weeks and relatively few caterpillars are seen after mid-July.

Following full caterpillar development, the gypsy moth is ready to pupate. They crawl to a protected place and change to the pupal stage (resting stage) in two or three days. The tubular pupal case is a

continued

reddish brown, ¾ to 1 inch long, attached to some object by a few silken threads. During the last instar and just prior to pupating, the large gypsy moth caterpillars migrate everywhere, causing many a homeowner considerable distress. This pupal stage lasts about 10 to 14 days, after which the adult moth emerges.

Moths. Male moths are about 1½ inches in size, tan to light brown in appearance and emerge four to five days before the females. The female moth is nearly white with faint dark wavy bands on the forewings. She is much larger than the male, with a wing span of up to 2½ inches. The male moth is an active daytime flyer; the female moth is so heavily laden with eggs she is unable to fly. Egg laying occurs soon after the moths mate. The female moths die after the eggs are laid, their life span being seven to ten days. Egg masses can be found anywhere depending on where the female caterpillar pupated. The eggs remain in the egg masses seven to eight months until early May of the following year. During a short period in early July all four stages of gypsy moth (caterpillar, pupa, moth and egg) may be found in any one location. The egg, pupal and moth stages of the gypsy moth cause no damage to trees; only the caterpillar stage is destructive.

feed preferences

Although it seems the gypsy moth caterpillar will eat almost any plant, it does have its favorite hosts within a group of 500 trees, shrubs and vines that are acceptable for feeding. All species of oak, especially white oak, apple, aspen or poplar, beech, birch, larch, linden, hawthorn, blue spruce, roses, witch hazel, sumac and willow are favored by all caterpillar stages. Older caterpillars particularly favor all oak, beech, hemlock, pine and spruce.

Moderately favored to unfavored trees are cherry, elms, black gum, hickory, maple, sassafras, sweet gum, and walnut. These trees are usually defoliated only when a heavy buildup of gypsy moths has occurred.

Some trees are not favored at all. They are arborvitae, ash, cedar, dogwood, grape, holly, honey locust, honeysuckle, horse chestnut, juniper, mountain laurel, poison ivy and sycamore; the tulip poplar is never touched. Caterpillars must be starving to cause even minor feeding injury on the plants listed in the not-favored category.

tree injury or death?

To see trees that were in full leaf in May and are suddenly almost bare in June is an amazing sight. Just as amazing is to watch buds open and a second set of leaves appear on heavily defoliated trees. These new leaves are usually smaller and lighter green but the tree is in leaf and living. In response to the loss of its first set of leaves, the tree digs down into its food reserves and manufactures a second set. Does this mean deciduous trees can tolerate endless defoliation? No; the gypsy moth does kill trees through repeated defoliation. The Bureau of Forestry appraised damage in areas where gypsy moths removed over 60% of tree foliage during two or more consecutive years. The average timber loss was 20% in these forest stands (range 5% to 60%). A 20% loss rate is considered tolerable in uninhabited and undeveloped forests; but a 20% loss rate in residential or recreational areas is distressing to homeowners. Heavy defoliation that persisted for three consecutive years or more killed 80% of the trees. Fortunately, large gypsy moth populations normally collapse after two years of heavy defoliation due to starvation, stress-induced diseases, and parasitism. Evergreens completely stripped of their foliage will die immediately following defoliation.

natural enemies

The gypsy moth has a number of natural enemies that tend to limit its population. Gypsy moth caterpillars (larvae) fall prey to bird populations indigenous to our region such as robins, catbirds, bluejays, orioles, bluebirds, chickadees, crows, sparrows, starlings, grackles, red-winged blackbirds, and cowbirds. Some mammals also have a predatory impact. Most of them are active only at night: the white-footed mouse, various species of shrews, meadow mice, voles, chipmunks, squirrels, skunks, raccoons, and opossums. Other parasites and predators include insects and diseases. A virus (wilt disease) has killed massive numbers of caterpillars causing a collapse of the gypsy moth in heavily defoliated areas.

Gypsy moth parasites and predators are not available to individuals. Nor do predators provide an immediate solution to the problem; however, they stabilize the reduced population after the initial collapse.

control options

The homeowner facing a gypsy moth infestation might consider one or more of the following options: do nothing; use biological controls; use chemical insecticides; use do-it-yourself non-chemical controls; use integrated pest management (IPM).

Do Nothing. By following this course, the homeowner hopes for a natural collapse of the population via predators and disease. Of course, before this happens, the homeowner will contend with larvae defoliating his trees from May to July. Although the larvae present no health hazard, their existence is not aesthetic and their droppings a nuisance. The population eventually collapses; though this may take several years and repeated defoliation of the trees before it occurs.

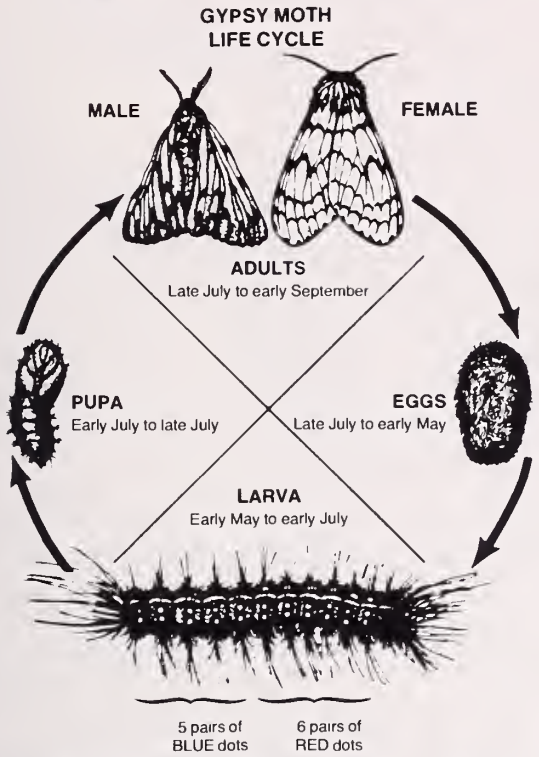
degrees of defoliation

TO CONTROL OR NOT TO CONTROL

Degree of Defoliation		Effect on Tree	Control
Light	- 0-30% of a tree	Hardly noticeable	None recommended
Moderate	- 30-60% of a tree	Tree remains green; no mortality expected	Optional. If not controlled caterpillars become abundant/ nuisance.
Heavy	- over 60% of a tree	At 60% level hardwoods create new foliage. Trees may die if defoliation reoccurs. In new areas pattern is 2 years light/2 years heavy defoliation. Gypsy moth population may self-destruct after second or third defoliation.	Use controls.

LIFE HISTORY

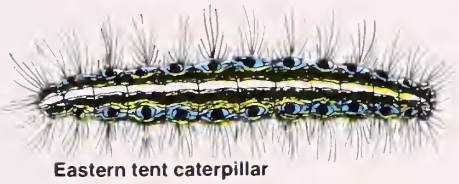
The gypsy moth develops in four stages—egg, larva (caterpillar), pupa (resting stage) and adult (moth). **Only the larva is destructive.**



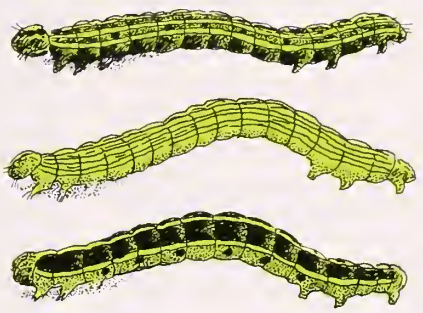
Differences between gypsy moth larva, tent caterpiller and inchworm



Gypsy moth larva



Eastern tent caterpillar



Color variations of inchworm

Biological Controls. *Bacillus thuringiensis,* sold under several trade names (Dipel, Thuricide, Biotrol), is a registered biological insecticide for gypsy moth control. It is one of the controls that the State Bureau of Forestry is offering to some of the counties for the Commonwealth's spray program. It presents no environmental hazards and is a good choice for use near streams, lakes, and other water impoundments. It may be applied by ground or air. Consult the label for dosage rates and details. *Bacillus thuringiensis* is relatively costly because of its slow action and because two applications are usually needed. Cool or wet weather reduces its effectiveness. Timing is important. Leaves should be expanded to about half of maximum size, that is, when the first spray is applied. The larvae are not killed immediately. It paralyzes the gut shortly after consumption and feeding stops, followed by death of the larvae in several days. Residual effectiveness is about five to seven days at which time the second spray is applied. Only the very young larvae are controlled.

Chemical Insecticides. Chemical insecticides have proven to be the most effective means of quickly reducing a gypsy moth infestation. Several insecticides are currently registered: Acephate (Orthene), Carbaryl (Sevin), Phosmet (Imidan), and Methoxychlor (Marlate).* Only one spray is required with these materials.

Orthene may be applied by ground or air. It is toxic to bees, but used with care it is relatively safe with mammals. The product has a mild disagreeable odor for a short time after application. It is systemic and has a long (14 days) residual and contact activity. It is commonly used by homeowners for other insect control on flowers, shrubs and trees.

Sevin may be applied by ground or air. It is widely used throughout the northeastern United States for gypsy moth control. It has a fairly good environmental impact record; for example, it is relatively non-hazardous to mammals and birds. However, because it is quite toxic to honeybees Pennsylvania discontinued using Sevin in its statewide spraying program; New Jersey continues to use it. Sevin is a stomach poison and the residue is about seven to ten days. Its performance record has generally been good. It is commonly used by homeowners for vegetable and flower insect control.

Imidan may be applied by ground sprays only. Its environmental impact record has been good. It is toxic to bees and has a residual of seven to ten days. It is a stomach poison. It is commonly used by homeowners to control fruit tree pests.

Methoxychlor may be applied by ground spray only. Just last year the label was expanded to include gypsy moth control. Its environmental impact record has been good. It has been used for many years for vegetable and ornamental plant insect control.

Apply sprays to control young gypsy moth larvae about mid-May. June and July applications to older larvae are far less effective. Older larvae are difficult to kill and when nearly mature often cannot be killed at all by these chemicals. Insecticide sprays are best applied when larvae are young and leaves are about one-half to two-thirds expanded. This will allow for the majority of eggs to hatch and is timed before serious defoliation damage takes place. Sprays must dry on the foliage to be effective. Once dry, rain has a minimal effect on spray residues. Control depends on timing of sprays and thorough coverge of infested foliage. Most homeowners are not equipped to spray large trees (over 20 feet). If insecticides are to be applied by ground sprays to large trees, commercial arborists using hydraulic or mist blower-type sprayers must be engaged. Homeowners who anticipate the need of a commercial arborist should make arrangements several months in advance. During the 1981 gypsy moth spraying season arborists were in great demand. Property owners with several acres of large trees requiring gypsy moth sprays should consider helicopter spraying, which is less costly than

continued

*For additional information the serious student of the gypsy moth may request a 34-page booklet, *The Gypsy Moth,* from the Bureau of Forestry, Box 1467, Harrisburg, PA 17120. The book contains a list of other available publications including: *The Homeowner and the Gypsy Moth: Guidelines for Control,* Home and Garden Bulletin 227, Division of Forest Pest Management Office, 34 Airport Drive, Middletown, PA 19057. Phone 717-783-2562.

ground sprays. Arborists can help arrange for helicopter spraying.

A recent innovation is a concentrated implant of systemic insecticide, which is transported by the sapstream to the foliage throughout the tree. When the caterpillar eats the treated leaves it dies. Orthene is available in an implant form; its label permits legal use only on birch, hawthorn, maple, pine and oak. The percentage of protective control is about 75%-80%, which is a tolerable level. However, the procedure is only practical for a limited number of trees or those requiring protection in a location difficult to spray from the ground. To use the implant system, closely-spaced holes are drilled in the tree trunk, and capsules containing the insecticide are inserted. This causes a series of tree wounds. Continually wounding a tree creates long-range negative results. The Orthene implants are available under the trade name of Acecap. Another implant insecticide labled for gypsy moth control is Bidrin, which is extremely toxic. *The Bidrin implants must be used only by specially trained certified applicators.* The trade name is Inject-A-Cide B.

All of the insecticides listed are aimed at the control of the larval form of the gypsy moth.

Dylox and Dimilin are two other insecticides registered for gypsy moth control for use in government control programs or by qualified foresters only.

Do-It-Yourself. Placing aprons around the tree trunks to collect the caterpillars that crawl down the tree trunks each morning to seek shelter during the day provides limited control. You can help protect a few street trees or shade trees by placing an apron or loose collar of burlap or similar material around the trunk of each tree. When caterpillars are half grown, many of them crawl up the tree to feed at night and crawl down the trunk in the morning to seek shelter during the day. The apron provides a site under which the caterpillars collect and can then be killed. Such aprons work best during late May and early June when caterpillars are half grown but before extensive defoliation takes place.

The apron must be kept in place for 10 to 14 days and must be checked daily so all trapped caterpillars can be destroyed. This economical control is usually effective enough to prevent severe defoliation; one can usually save enough foliage to keep the trees green. This method may not be very effective on trees that are part of a heavily infested forest or wooded area. Repellent tape (Repel 'M) has limited value in protecting some trees. It will not protect from small caterpillars that drop onto the tree from air currents nor from caterpillars that hatch from egg masses located above the tape on the tree trunk. The tape prevents caterpillars from crawling up evergreen trees and other species in the non-preferred category since the caterpillars develop and feed on a preferred species first.

IPM. Integrated Pest Management is the intelligent selection and use of all options mentioned. First, understand the gypsy moth life cycle; next, monitor the population; then, use do-it-yourself control measures. Finally, select an appropriate insecticide and apply only when defoliation will be severe enough to cause death to important landscape trees and shrubs. Spraying an insecticide for a few chewed leaves and caterpillars is environmentally unnecessary, wasteful, and expensive.

measures of questionable or no value

Locating and simply destroying egg masses during the fall and winter is not feasible since most egg masses are either not found or are practically impossible to reach. Its value is questionable and especially so in areas of high infestations. It is impossible to destroy enough eggs to halt next year's population.

Do not dab egg masses attached to live tree bark with creosote, kerosene or other chemicals toxic to plant growth. It may injure the tree. Do not scrape egg masses off trees or other objects and let them fall to the ground. The eggs will hatch wherever they drop. If you do scrape off egg masses, collect them in a can containing kerosene or alcohol, which will kill the eggs. Do not apply Tanglefoot or sticky compounds directly to tree bark to prevent caterpillars from climbing the tree. Frequent application can injure or kill some trees.

Sex lure traps: Male moths readily respond to the sex lure of female moths, and many males can be attracted to traps baited with a synthetic lure. However, such traps are *not* effective as a control measure. The traps do substantiate that male gypsy moths are in the area, but this is generally already known. Since all male moths cannot be captured before they mate with females, trapping as a control measure is a waste of time and money.

research – help on the way?

Unfortunately, current research has no short-range, just-around-the-corner miracles to subdue the gypsy moth. Dimilin, a new new hormone product used in government control programs, is still in the experimental stage. It stops caterpillars from pupating; however, trees are still defoliated. Research is currently centered on efforts to develop strains of the virus disease that could be used as a spray to cause collapse of the gypsy moth before heavy populations build up. Gypcheck is an example of a commercially prepared virus compound under trial by the United States Forest Service.

Gypsy moths are more of a people problem than a tree problem. People who live with a moderate or heavy infestation are disgusted with the ubiquitous caterpillar. It is unpleasant to have decks, walks and driveways covered with droppings. Equally upsetting is not being able to enjoy spending time outside working or relaxing from late May to mid-July.

The damage, according to one forester, is more a social than an economic insult. Overall, in a forest area, the losses are not usually catastrophic. In a suburban yard, however, the loss of a favorite oak or beech is traumatic.

None of man's controls are a complete panacea; we must recognize all the alternatives available. Scientists agree pesticides are only a piece of the puzzle for total gypsy moth control. The gypsy moth is a serious nuisance that must be understood, scientifically combated, and tolerated.

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Jim McKeehen is the Delaware County agricultural agent for the Cooperative Extension Service, College of Agriculture, Pennsylvania State University.



photos by Edmund B. Gilchrist, Jr

The author in front of her home. Brilliant red salvias in containers and softer red impatiens behind them brighten the September garden.

Where Do Your Gardens Grow? Upstairs & Downstairs and on the Patio-o-o

by Jane G. Pepper

Upstairs and Downstairs and on the Patio. Cities are for gardening and in every available spot.

She started in 1963 when she and her family moved to Larchwood Street in West Philadelphia. First it was one cedar tree out front, then the backyard garden, followed by a garden in the basement. Next came a flower-filled "balcony-for-one" off the front bedroom and finally, this past spring, she constructed a rooftop garden. In 1979 she won the blue ribbon in the Pennsylvania Horticultural Society City Gardens Contest in the individual flower garden section and, last summer, she captured first prize in the container-grown plants division.

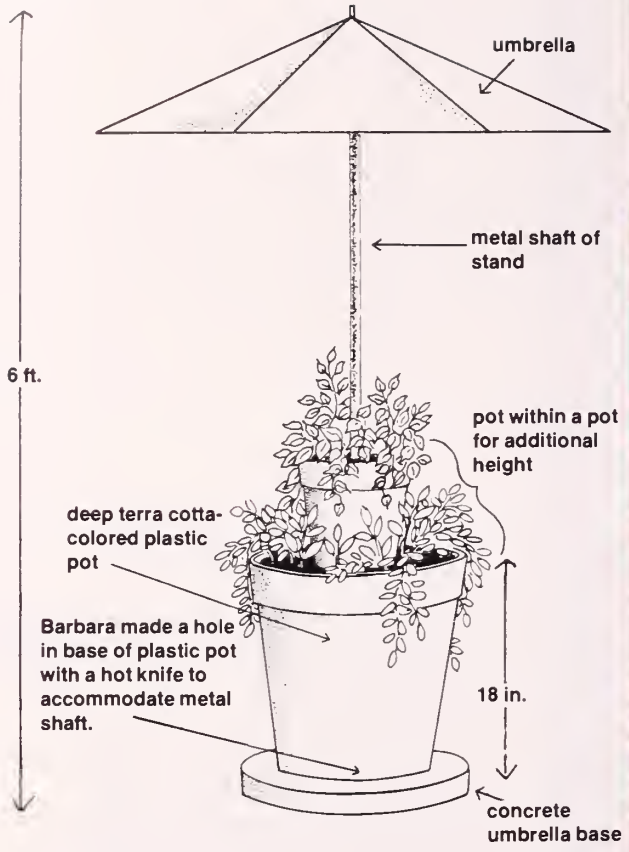
Gardening is Barbara Truman's hobby, her self-proclaimed "weakness" and a pastime that has turned her into builder, carpenter, electrician or plumber, depending on the garden she's bent on creating.

the front garden

The front garden is gay and neat and just an appetizer for the delights that follow. In her tiny West Phladelphia backyard Barbara has created a grape- and wisteria-covered arbor and surrounded herself with more than 40 hardy plants

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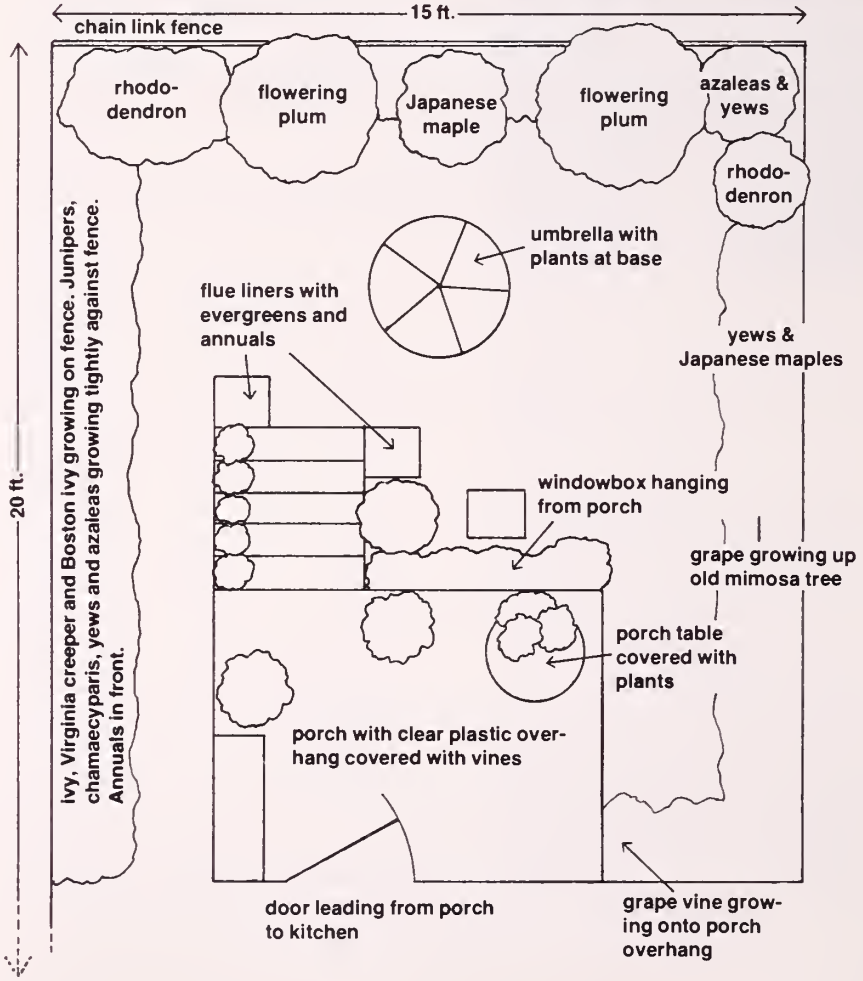
Where Do Your Gardens Grow? continued





Steps leading from the patio are edged with container-grown plants, vines and shrubs.

The Back Garden



that are accented with colorful annuals throughout the summer.

the back garden

The backyard totals less than 300 square feet. The Japanese maples, rhododendrons, azaleas, junipers, yews and other needled evergreens are planted in narrow beds along with two flowering plum trees. Vines such as ivy, wisteria, grape, Boston ivy and honeysuckle are planted in every possible nook, then trained along the seven-foot-high chainlink fence, up the banisters and over the porch canopy, and up the tall stump of an old mimosa tree. Barbara has planted woody plants, such as boxwood, juniper and yew in terra cotta flue liners and large plastic containers. In spring she adds impatiens, begonias, ageratum and trailing vinca for additional color. In making this backyard garden Barbara's goal was total privacy. When you sit on the back terrace, instead of staring at the backs of neighboring houses, you enjoy a parade of azaleas and rhododendrons in spring followed by luxuriant greenery and bright annuals in summer.



It's September and the first year roof deck garden is ablaze with geraniums, petunias, marigolds and a climbing wisteria (on the left).

As a child Barbara was out collecting weeds. After she got her own home she frequented Sears' garden section while her friends looked at fashions and furniture in other departments. Before she installed the first plants, Barbara spent spent several months preparing the soil,

Every night, when she returned from her late nursing shift around one a.m. she would dig for one hour before going to bed. It took her 12 months but Barbara finally had a four-feet deep hole walled with poured concrete.

knowing that if she wanted a forest amid the concrete she would have to give the plants extra help. From odd places she purchased manure and gradually accumulated enough soil to fill the beds. Then she returned to Sears, time and time again, buying plants on sale.

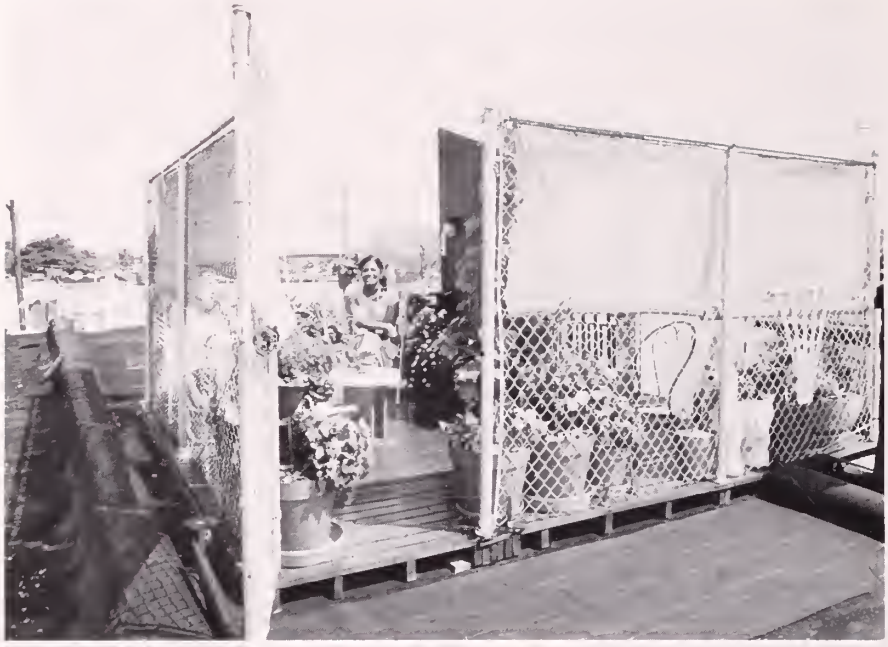
In the enriched soil the tiny plants thrived and gradually screened out the surrounding neighborhood. Each year, in April, Barbara takes a week's vacation from her position in the nursing service at Veterans Hospital to give all her

continued



When the author returned from her night nursing shift she dug and built this pool in her basement. She also painted the backdrop.

Where Do Your Gardens Grow? continued



Another view of the roof deck

gardens special attention. At this time, she feeds all the hardy plants with Miracle-Gro, 15-30-15. During the balance of the summer she fertilizes each time she waters, adding one teaspoon of Miracle-Gro per two-gallon can of water.

Unwilling to use pesticides, Barbara is constantly on the watch for insect infestations. At the first sign of mealybugs, scale, aphids, white fly or red spider mites she sprays with a dilute solution of detergent such as Ivory Liquid. From bitter experience she has learned the correct dilution–two drops of detergent per quart of water. A couple of years ago, eager to get rid of some persistent mealybugs, before the City Gardens Contest judges arrived, she used a stronger concentration, sprayed on three consecutive days and defoliated most of her indoor plants.

the basement garden

With the back garden planted and thriving, Barbara grew restless and decided to turn one corner of the basement into her next garden. Determined to incorporate a pool, she started to excavate. Every night, when she returned from her late nursing shift around one a.m. she would dig for one hour before going to bed. Her son was at a loss to understand these nightly activities and would inquire frequently if his mother was digging a grave. It took her 12 months but Barbara finally had a four-feet deep hole walled with poured concrete. Barbara's construction guide was John Burton Brimer's *Homeowners Complete Outdoor Building Book*, and she successfully translated his instructions for building larger outdoor pools to meet her own specialized requirements.

Determined that her pool should not leak, she covered the concrete with layer upon layer of waterproofing material. Behind the pool she painted a tropical scene. In the old laundry tub (which would have been hard to remove from the basement) and in countless containers she planted bromeliads, dieffenbachias, polyscias, ferns, philodendron, a Norfolk Island pine, Swedish ivy and grape ivy. The pool provides humidity and along with a series of fluorescent lights, hooked to timers, creates an excellent atmosphere for tropical plants.

a roof garden

Not satisfied with the "balcony-for-one" off the front bedroom with a few container-grown plants, the following year Barbara went through the ceiling and started on her fifth garden. Last June a contractor cut a hole in the roof of her two-story house and installed a spiral staircase to link the roof garden with the rest of the house. A plexiglass cover provides good light for the indoor plants that hang around the stairwell. As the contractor worked on the roof, Barbara kept handing him bags of soil, pots and plants. The summer was running on and she wanted to make sure her plants were bursting with blooms when the City Gardens Contest judges arrived in July.

Once again Barbara sought privacy and located the garden in the middle of the roof, away from curious onlookers. The contractor determined the weight the roof would bear. Following the installation of the slatted wooden deck, Barbara surrounded the garden with a six-foot chainlink fence.The fence is now covered with roll-up blinds. Later, when the climbing vines have developed, the combination of blinds and vines will cover the fence.

Large terra cotta-colored plastic pots are planted with petunias, geraniums, marigolds, impatiens, salvia and begonia. There's a juniper in one corner, three potted Japanese maples, a grape vine in a tub and a wisteria vine already creeping up the structure that covers the hole in the roof. Because she's growing many plants in such confined areas, both on the roof and elsewhere, Barbara prunes constantly, never allowing one plant to invade another's territory. To her the joy of her gardens lies not only in the luxuriance but also in the diversity. In both the rooftop and the backyard gardens Barbara has incorported an umbrella for additional shade. As shown in the drawing on page 14, she has incorporated a planter into the base of the stand.

Of all her gardens Barbara declares the most recent is the most satisfying because, on the rooftop, she can enjoy the color and greenery by day and the stars by night, all in complete privacy. Even the noises of West Philadelphia are muffled there.

With ingenuity, creativity, lots of hard work and some plants Barbara has surrounded herself with an unusually green environment. I hardly dare ask her what her plans are for '82.

•

Jane Pepper is executive director of PHS. As a judge for the City Gardens Contest she visited Barbara Truman twice, first in 1979 and later in 1981.



A Rare Primrose: Abkhazian Primrose

by Harold Bruce

The March 1980 issue of *The Green Scene* carried a stunning cover photograph by Gottlieb Hampfler showing an early scene at Winterthur–the Hellebore Walk, with its mauve Korean rhododendrons and pale yellow winter-hazels underplanted by hellebores and a variety of herbaceous plants blooming in complementary shades. One of these associated plants, figuring prominently in the photograph and listed simply as "primrose," deserves further mention. It is fairly new in American horticulture, still so rare and relatively unknown that it is unlisted in standard garden works, including *Hortus III*.

The plant first came to Winterthur in 1965 from H. Lincoln Foster's garden in northwestern Connecticut. Foster's *Rock Gardening* (Houghton Mifflin, 1968) contains the only mention of it in the literature that I have yet seen. He calls it a geographical variant of the English primrose *(Primula vulgaris)* that is probably distinct enough to warrant full specific status. By Foster's reckoning, the plant could either be called *P. vulgaris* var. *abchasica* or *P. abchasica*. It comes from the Russian Caucasus, which may in part explain its rarity in western gardens. The scientific name is a reference to the Soviet republic of Abkhazia on the coast of the Black Sea at the western end of the Caucasus Mountains. This region is also commemorated in the name of another of its endemic plants, *Helleborus abchasicus*.

The species (or subspecies) is distinct from the ordinary primrose in many ways. Perhaps the most important difference is that it blooms much earlier in spring, usually by at least a month. First flowering dates at Winterthur vary from March 8 to April 6, depending on the severity of the winter and depth of snow cover. It differs also in shape of leaves, these being more spatulate (broadest towards the tip) and toothed than those of *vulgaris*. Foster aptly compares them to dandelion leaves. In color it is very distinct. The flowers of the English primrose are typically yellow, varying to red and purple in geographical forms, but I have never seen any of the latter that approach the depth and sharpness of the flowers of *abchasica*. It is a rich, deep pure magenta that changes somewhat with temperature, sharper and bluer with frost and warmer and rosier as the temperature rises. Like those of *P. vulgaris,* each of its flowers is raised on an individual stalk that grows from a leaf axil–unlike those of most primroses, which are clustered at the summit of a scape. There are so many flowers on a single plant of *Abchasica* that at flowering time the plant is a mound of magenta. After flowering the leaves elongate to nearly a foot.

There are so many flowers on a single plant of *Abchasica* that at flowering time the plant is a mound of magenta.

The uses of an early-flowering, brilliantly colored plant like this are many. Its color, were it to bloom in June, might seem harsh, but in the lean days of late winter it is extremely welcome. The Prussian blue of the Siberian squill is an equally sharp, eye-catching color, and makes a combination with the primula that fairly shouts spring is here. Another pure, vibrant blue is found in the common lungwort *Pulmonaria angustifolia,* which enjoys the same sort of semi-woodland growing conditions as the primula. These three are beautiful in a mosaic of early spring flowers in softer blues, lavenders and whites: anemones, chionodoxas, Virginia bluebells, bloodroot, and puschkinias. I would not recommend planting the primula near the hot or acid yellows of common forsythia or 'King Alfred' daffodils, however.

At Winterthur it has been used very skillfully in a planting that is really the first big show of early spring. A group of shrubs and small trees state the theme in pale yellow and rosy lavender paling here and there to pink and white. These are flowering cherries, *Prunus* 'Accolade' (pink) and *P. tomentosa* (white); three species of winter-hazel *(Corylopsis pauciflora, platypetala,* and *spicata)* in pale yellow; Korean rhododendron and its cultivar 'Cornell Pink' in mauve and pink; fragrant viburnum *(V. farreri)* in pink and white; and finally cherry prinsepia *(Prinsepia sinensis)* whose golden green new leaves are as showy

continued



photo by Harold Bruce

The beautiful primrose amidst the fallen flowers of Korean rhododendrons

as its small yellow flowers.

Around and beneath these plants the ground is carpeted with herbaceous plants like the strong-leaved evergreen hellebores. *Helleborus niger,* the Christmas-rose, has large, waxy flowers of pure white. *H. atrorubens,* at the other extreme, has flowers of a very deep purplish maroon. In between are hybrids of the Lenten-rose, *H. orientalis,* their flowers finely freckled with rose, purple, green or combinations of these in varying degrees on a white ground, so that their color effects are so subtle as to be almost beyond description. Large patches of *Corydalis bulbosa,* which looks something like a Dutchman's breeches in grayish lavender or dusky rose, run between the hellebores and beneath the shrubs, accented by evergreen, rose-flowered bergenias and occasional troutlilies in rose or yellow. Beyond the shrubs is a drift of the pale lemon reverse bicolor trumpet daffodil 'Hunter's Moon.' Among all these pale or muted shades the rich wine of the primula gleams.

Snow often covers these early flowers, and in many years hard freezes take their toll of them, but even when the first blossoms are frozen, new ones take their places as the weather warms. A marvelous effect, almost Japanese in its delicacy (and certainly calculated by H. F. duPont) occurs when the spent flowers of the rhododendrons fall and litter the ground around the primulas. On the bush these flowers are a warm rosy lavender, but after falling a strong blue pigment suffuses through them so that they become, for a brief period before they wither, as sharply magenta as the flowers of the primula. The new living blossoms of the primula seem to gather color from the cast-off dying blossoms around them.

Culture of the Abkhazian primrose is similar to that of other woodland primulas. It requires a shaded or half-shaded position and slightly acid soil rich in humus. Plants in the extremely acid soil of my present garden declined until I limed them, so I conclude that the kind of soil that grows teaberry and trailing-arbutus well is unsuitable for this primrose. It wants adequate drainage, but as with all primroses, it will not endure soil that dries out in summer. This, along with competition with weeds and other seems to be the main reason for failure with it.

Only Source

The plant shop at Winterthur is open year-round. Plants of Abkhazian primrose will be available in the spring beginning in April.

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Harold Bruce is curator of plant collections at Winterthur. He taught English at the University of Delaware for 14 years. Bruce is author of two books: *The Gardens of Winterthur in All Seasons* (Viking Press, 1968) and *How to Grow Wildflowers and Wild Shrubs in Your Own Garden* (Alfred A. Knopf, 1976).



photos by author

Wonderful coarse-textured leaves appear in early April. Note the old flower stalk from the previous season.

Flower buds forming as the leaves begin to wither. The scapes grow slowly; these are still one month from flowering.





Ramps in bloom during late June in the author's garden

RAMPING THROUGH THE WOODS

by Andrew C. Durham

One of the first native wildflowers I ever collected to add to my new garden was an onion relative. I was then about 15 years old and roamed through the woods exploring, looking for turtles, and collecting ticks. Growing things had always interested me and on that day it was the wild leek that attracted my attention. My great dane stared over my shoulder as I bent to examine the dried remains of the plant, also known as the broad-leaved garlic and *Allium tricoccum.*

That encounter was sometime in August. By then the bulbs were dormant and the flowers long past. All that remained were dried flower stalks indicating that a colony of *something* had existed here in the most shaded part of a mature forest in Northern Delaware. Curiosity overtook me, and a nearby stick and an inquisitive great dane helped to unearth the bulbs, just over an inch deep. I quickly gathered a few to take home realizing that these were very different than the

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RAMPING THROUGH THE WOODS continued

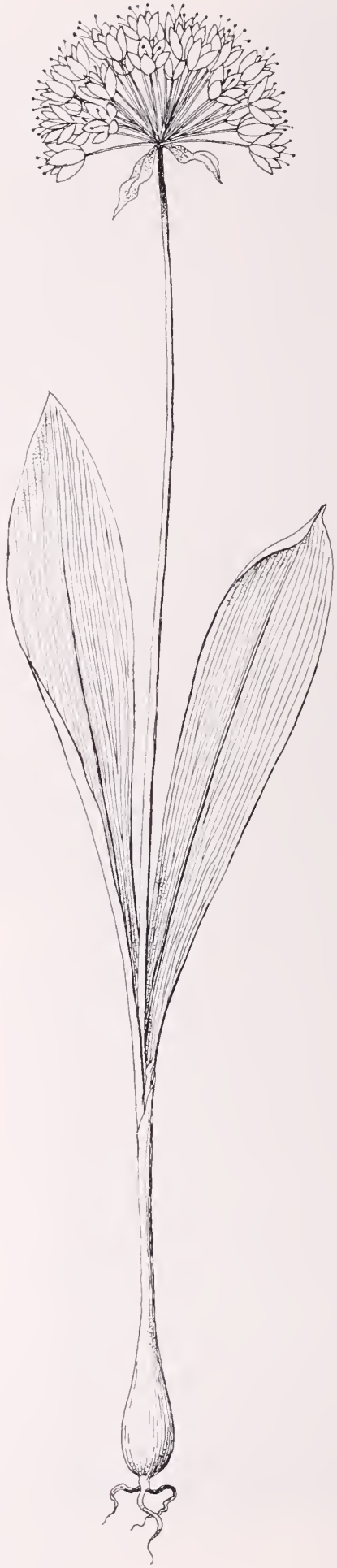
spring bulbs I was more familiar with at the time. Tulips and daffodils then constituted my realm of knowledge of the bulb world and those died away without leaving the interesting dried stalks I was now looking at.

Every year in late March or early April I am convinced of the ornamental value of this native onion. Weeks before most perennials have leafed out, the wild leek is fully developed with unusually large leaves for such a small onion. From each bulb, two or three basal leaves emerge quickly growing to ten inches tall and two in breadth. Against the still barren soil around them, these appear surprisingly lush and vigorous, a sight pleasing to any winter-weary eyes.

The early start is surely an adaptation to its life under dense deciduous growth. As the shrubs and trees overhead leaf out, the leaves of *Allium tricoccum* slowly change from a refreshing light green to a darker color and by the time the canopy overhead is fully developed, the wild leek's leaves have begun to wither and turn yellow indicating that the bulbs have been replenished. Certain lilies, terrestial orchids, and other forest plants share this habit – a clever way to use the strong light available in early spring before larger deciduous plants have stolen it.

"They's not for ladies or those who court them."

The Phoenix-like flowers, rising from the dead leaves around them, become noticeable as the leaves die. The flower stalks, or scapes, slowly expand to eight or ten inches, raising the pointed buds that contain the developing umbels above the decaying leaves. Like the flowers of *Lycoris,* they stand on leafless stalks above bare earth and intrigue even the most horticulturally apathetic. While most onions bloom with their foliage, the inflorescence of this *Allium* is otherwise typical of the genus – the purplish sheath splits down one side freeing the cluster of 20 or more flowers. The umbels are hemispherical and the individual flowers small, perhaps only 1/2 in. across, but they are in proportion to the diminutive size of the plant. Each flower bud unfolds to six petals, at first a greenish white, slowly changing to a pearl-white as they age. The flowers are quite noticeable against the bare soil where the leaves have disappeared and if used in masses they can become an unusual feature.



Flowering in the absence of leaves is a trait found in many bulbs (notably *Amaryllis, Lycoris,* and *Nerine* of Amaryllidaceae and *Colchicum* of Liliaceae, the family to which *Allium* belongs). In most cases this allows the leaves to use seasonal rains in areas prone to yearly droughts. Only when we take these plants out of a Mediterranean climate and put them in areas with more equally distributed rain does the way these bulbs grow strike us as unusual.

To the wild food connoisseur, *Allium tricoccum* is considered one of the best wild onions available. In the South, the plant is known as ramps and in late summer Ramp Festivals are held to indulge in this *Allium.* The bulbs are sliced and eaten raw, made into French onion soup, or fried with butter. They are mild and sweet, distinctly onion, but with a hint of garlic. It is said that Marquette and his party, in their journey from Green Bay to present-day Chicago, subsisted largely on ramps and a related species *(Allium canadense).* As the common name wild leek implies, the plants may also be treated like garden leeks. The leaves emerge as a cylinder in late March and as they begin unrolling at the top, they are very good cut up and added to a salad or made into leek soup. Soil may be pulled up around the leaves to blanch them but I have only eaten them green.

Upon harvesting you will notice how strongly scented the plants are. A ramp fancier from the Appalachian is quoted in the Foxfire books as remarking, "They's not for ladies or those who court them."

Certainly, though, we can all grow them in our gardens. *Allium tricoccum* is native to deciduous woods and thickets from Georgia through New England. It grows in a variety of habitats from rocky upland soils to alluvial soils, but generally one finds it where moisture is plentiful, the soil is rich, and summer shade excludes most other plants – hunt for it in early April when its leaves stand out. As the wild leek is probably not eas-



photo by Rick Colbert

Allium tricoccum surprised many people at the 1981 Delaware Flower Show. It was used by show designer Armisted Browning, Jr. in a central exhibit featuring native plants.

ily available in the nursery trade,* *be considerate and careful when collecting for your own garden.* Once acquired, the quickest means of developing a large stock is by seed. *Allium* seeds are best sown as soon as ripe (in this case, July-August) – the safest method is to plant in a pot and plunge into the soil outside or place in a cold frame. They appear most natural used in broad masses in wooded areas or under deciduous shrubs where other perennials refuse to grow. Native, forest groundcovers, such as ground phlox *(Phlox stolonifera)* or winterberry *(Gaultheria procumbens),* are appropriate companion plants and will help to hide the soil after the *Allium* disappears.

This plant is not as well-known as its numerous common names would indicate. Wild leeks and broad-leaved garlic describe its culinary possibilities and family membership while ramps has a more obscure origin. This latter name is most likely derived from Rampion, the common name for *Campanula rapunculus* whose long radish-shaped root (*rapunculus* means "a little turnip") was at one time eaten raw in salads, boiled like asparagus, or whose leaves were blanched like celery.

The flowers never fail to provoke exclamations from visitors in my garden including even well-seasoned horticulturists – and the early, coarse-textured leaves are always greatly appreciated. Of course, after the guests leave, the bulbs may be dug up and eaten! In my garden, a dry, rocky hillside, those bulbs collected over eight years ago return faithfully every year but have not spread much. Provide it with a loose, fertile soil and summer shade, and *Allium tricoccum* will grow rampantly for you.

Sources for *Allium tricoccum:*
Gardens of The Blue Ridge
P.O. Box 10
Pineola, NC 28662
Griffey's Nursery
Rt. 3-B 17A
Marshall, NC 28753

●

Andrew C. Durham is currently a short-term entrant student at the Royal Horticulture Society's garden at Wisley, England. While in Delaware Valley he has worked in the experimental, nursery of J. Franklin Styer and at a number of commercial, fine private and public gardens including the A. H. Scott Horticultural Foundation. He was assistant to the designer of the 1981 Delaware Flower Show, Armisted Browning, Jr.



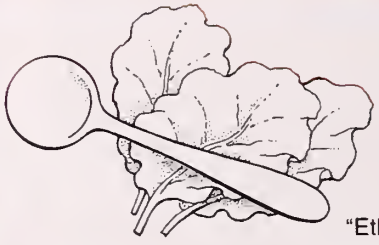
photo courtesy of Philadelphia Green

A gardener from the Palethorpe Street Garden proudly displays her collards.



photo courtesy of W. Atlee Burpee Co.

Roma VF tomato



Is Ethnic

by Natalie Kempner

"Ethnic" comes from the Greek "ethnos" meaning "nation." It is defined as national, indigenous, cultural, original, unique. It could be argued, then, that every garden is "ethnic" in that it is native, indigenous, unique — to its environment and to its gardener.

In the upstate New York elementary school that I attended in the 1930's, geography, that forerunner of social studies, was vividly taught. Studying Norway, we ate sardines; Switzerland, we ate cheese; Arabia, we came to school wrapped in sheets and sat around eating dates. When we studied our local Iroquois Indians, we grew and ate their "Three Sisters": beans, corn and squash.

A few years ago in Philadelphia, aware that urban kids are losing not only their sense of cultural roots, but also their connection with the sources of life's energy, I revived these memorable old lessons linking culture and environment. I worked with public school students designing gardens to reflect their backgrounds. They dreamed up a Puerto Rican garden with mangoes, plátanos, papayas, pineapples; a Soul Food garden with okra, sweet potatoes, collards and black-eyed peas; a German garden, a Vietnamese garden. It was, of course, an academic exercise. When we planted our garden on a city lot, we chose what neighborhood gardeners assured us would grow fast enough to be eaten in a salad before summer vacation at the end of June. We thereby produced our



photo courtesy of W. Atlee Burpee Co.

Arugala



photo by Natalie Kempner

Tatiana Bembischew in her West Kensington garden



photo by Mona Dwork Gold

Herb vinegars are an expansion of the creative ethnic garden and kitchen arts at Friends Hospital

In the Gardening or In the Cooking?

Is there something called "ethnic gardening" in Philadelphia? What IS "ethnic gardening"?

own "ethnic" garden, appropriate to its place and purpose.

As a Philadelphia Green Advisory Board member, I have visited gardens all over Philadelphia. Only once have I come upon a garden visibly identifiable as "ethnic" in the "national" sense. I was househunting with George, a Spanish language teacher who wanted to live in a Hispanic neighborhood. On Norris Street, across from a Spanish grocery store, we peered through a wrought-iron fence at a garden patio planted with herbs, tomatoes, a fig tree and a grape arbor, heavy with fruit.

"Just like my grandfather's garden in Italy," said George.

A wiry old man approached us and, within minutes, it was established that George's grandfather and this man grew up in the same Italian village. As we sat by the fig tree sampling homemade wine, we learned that for 50 years this man and his wife have been the only Italians in a Catholic parish that was German speaking when they arrived and is Spanish speaking now.

I am not sure whether this was a little of Italy in the United States, or South Philadelphia in North Philadelphia, or Italy in Puerto Rico. Surely, though, it is Penn's "green countrie towne" as he would have wished it — hospitable.

West Kensington, which is the area I know best, is one of Philadelphia's most heterogeneous neighborhoods. Some West Kensington gardeners are third generation German, Irish, and English; their families settled there when Kensington mills and Stetson Hat were flourishing. Some are Afro-Americans with parents or grandparents in the rural American south. Many are Puerto Ricans whose parents, if not themselves, grew up on a tropical island close to the soil. Most are natural horticulturists who instinctively understand the relation of seed to flower to fruit.

Touring West Kensington gardens with an eye to "ethnic" differences, one might detect slight variations in crop choices. An abundance of hardy root vegetables and cabbage might betray a North European background, whereas a specialization in sun-requiring tomatoes might indicate Caribbean origin.

Gardens are our defense against the monotony of fast food establishments and mass marketing, and so a defense against the loss of our ethnic variations.

But what makes a garden "ethnic" is not the crops. The evidence of national character comes in the kitchen with the preparation of the harvest.

"Ethnic" dishes do not derive from the professional chefs who proclaim and write about them. They are an inheritance from peasant cooks using modest ingredients available to them according to season and place. Usually such dishes are hearty, tasty, simple — *and* nourishing. *(Diet For A Small Planet* points out the perfect protein in traditional Puerto Rican rice and beans.)

Cabbage, tomatoes and the ubiquitous potato become "ethnic" dishes with preparation — often through seasonings. Where the Greeks use lemon, oregano and olive oil, Asians use curry; Mexicans, red pepper; Anglo-Saxons, black pepper and salt. The Italians use varied combinations of herbs grown on sunny slopes.

The farther we get from the source of food, the farther we are removed from the food of our foremothers and fathers. Without fresh, quality ingredients, traditional cooking becomes folklore — myth dimly recalled through a frozen pizza, a packaged sukiyaki dinner or a tin of borscht from the supermarket shelf.

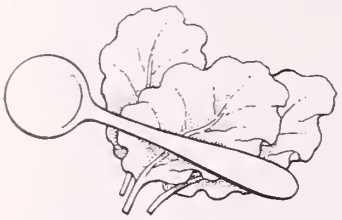
Gardens are our defense against the monotony of fast food establishments and mass marketing, and so a defense against the loss of our ethnic variations. As inflation challenges us to grow our own food, it may also act to allow us to preserve and share our cultural traditions.

How then, do we investigate the state of Philadelphia "ethnic" gardening? Get an invitation from a gardener for a meal so that all the glorious ethnicity of gardening is revealed. Evidence of this is in the recipes we have gathered from gardener cooks.

continued

Natalie Kempner was recipient of the PHS 1976 Teacher of the Year Award; a member of the Philadelphia Green Advisory Board; and a retired director of the Norris Square Neighborhood Project, an environmental education center in West Kensington. She is living in England for a year and will return to Philadelphia in July.

continued



Arugula

Arugala, also called roquette, rocket, or rucola, is a mustard-like plant; its slightly pungent leaves are delicious in salads. It is quite common in Italy.

culture

Plant seeds outdoors in ordinary garden soil in a sunny location after all danger of frost is past. I make three or four more sowings at two week intervals. For fall crops, I resume planting toward the end of August.

Plant seed in rows 15 in. apart and cover with ¼ in. of fine soil, well pressed down.

When plants are three inches tall, thin to 6 in. apart and eat pulled plants. Leaves will be ready to eat in six to seven weeks, when they are 1-1½ ft. tall.

Water frequently during hot weather to promote vigorous growth and cut frequently to promote tender foliage.

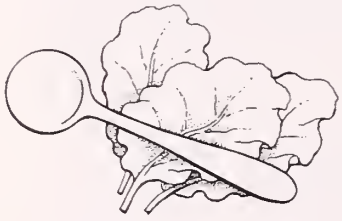
Arugala Salad

Fill a glass bowl loosely with washed, dried, and chilled arugala leaves. Over it strew 3 or 4 slivered green onions and ½ cup or so of very thinly sliced mushrooms.

For the dressing, in a small bowl mince about 2 teaspoons onion. Mix into it one scant teaspoon Kosher salt, ½ teaspoon cracked pepper, and 2 tablespoons Dijon mustard. Moisten this with 2 tablespoons of wine vinegar. With a wire whisk, beat into it gradually 4 tablespoons of olive oil and 4 tablespoons of vegetable oil. Stir in ¼ teaspoon lemon juice and pour desired amount over salad, and toss.

Janet Simmons

Janet Simmons has a small "salad" garden in Wynnewood. Yes, she does grow arugala.



Collard Greens

Collard greens have been flourishing in my garden since 1970. I start them in early spring with seedlings purchasd at a local greenhouse, selecting the largest plants for growing. Collards need lots of sun and regular watering. The soil should be a mixture of peat moss (not too much) mixed with sand and top soil.

I set collard greens up in rows, placing each plant approximately 12 in. apart. I weed carefully and pick off the yankee bugs by hand, putting them in a glass jar with a lid until they die. Before you know it, the big leafy collards resemble small bushes. It's best to harvest in the fall after the first frost. The leaves are sweeter then and ready to eat.

Recipe

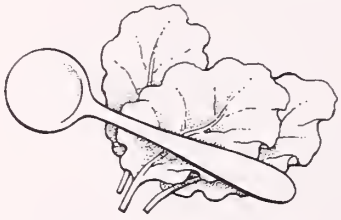
Wash 2 to 3 lbs. of collard greens thoroughly to remove sand or grit. Cut out any blemished areas or tough stems and cut leaves into medium size pieces. Set aside.

Place in large pot a 2-lb. piece of side meat. Salt pork, smoked ham or bacon can be used. Pour in enough water to cover meat and simmer until tender (about two hours). Remove meat and add prepared greens to water (which is now a tasty broth) and cook approximately 45 minutes or until tender. Taste testing is advised.

Collards may also be cooked in a pressure cooker at 15 lbs. of pressure for 10-15 minutes. Prepare greens as stated above and set aside. Boil meat until tender. Add some juice from the meat (approximately one cup) to pressure cooker along with the collard greens and cook.

Donna B. Thorpe

Donna Thorpe is a member of the Philadelphia Green Advisory Board. She was awarded a blue ribbon at the 1981 Harvest Show for her white grape wine and a red ribbon for her pumpkin.



Roma Tomatoes

Roma tomato plants produce vigorous vines, covered with dozens of bright-red, medium-small, pear-shaped fruit of smooth texture and uniform size. Because they have thick flesh and very little juice, they are excellent for canning, paste, sauce, in salads and for cooking in general. They mature 76 days from the time they are set out in the garden.

To plant seeds indoors, prepare soil in flats or plastic egg cartons as follows: Three parts of well decomposed compost, one part vermiculite or peat moss and one part sand or potting soil. If compost is not available use a good potting

soil. Mix thoroughly and place in flats or plastic egg cartons, approximately 2 in. deep. Plant seeds about ¼ in. deep and ¼ in. apart, using a pencil to form the holes. Keep the soil moist, but not soggy.

After germination, give the plants 15 to 18 hours of light per day, using a fluorescent light or grow bulb placed 4 in. to 6 in. above plants. If placed on a windowsill where sunlight is available most of the day, you can dispense with the artificial light.

When seedlings have developed their first pair of true leaves, about two to three weeks after planting, transplant into 2 in. pots.

Fertilize every 10 days with any basic soluble indoor plant fertilizer. Avoid overwatering. Use pots with drainage holes, and don't leave water standing in the dish. Don't leave plants where nighttime temperature drops much below 60°F.

When outside temperatures reach 60°F or above, transfer plants to outdoors during the daytime only, and return indoors at night when the temperature may go below 60°F. Continue this routine for approximately two weeks so that plants will gradually harden and become acclimated to sudden changes in temperatures after transplanting into the garden.

preparation for planting in the garden

Prepare soil by tilling to a depth of 6 in. to 10 in. and level off. Form furrows approximately 3 in deep, using either a rototiller furrower or by hand with a hoe. Space furrows approximately 3 ft. apart.

When plants are 4 in. to 5 in. high, remove plants and soil from pots and place in furrow, firming ground around roots with a garden trowel. Space plants approximately 24 in. apart in the furrow. Water thoroughly, allow two or three days for the plants to take hold; then put a generous amount of compost (about two shovels) around each plant.

When plants have grown 6 in. to 8 in. high, drive 5 ft. to 6 ft. stakes approximately 1 in. to 2 in. from base of plants. Loosely tie plants to stakes with cloth or twine. As plants grow, continue to tie them to stakes every 5 in. to 6 in.

Cultivate every 10 days with rototiller or a hoe to loosen up the soil and gradually fill the furrows with soil. When the furrow is completely filled with soil, till around base of the plants with a hoe.

Mulch the ground with any of the following: cornstalks, hay, straw, sawdust, newspapers, cardboard, plastic vinyl, wood chips, manure with plenty of straw in it, plywood or composition board. At one time or another I have used all of these materials with excellent results.

As the plants grow, remove the first two or three sets of leaves and suckers from the bottom of the plant. That will strengthen the growth further up and produce a more vigorous growth of blossoms and fruit.

Canning Roma Tomatoes

Use only firm, high quality tomatoes. Don't can soft, decayed, cracked, molded or spotted fruit.

raw pak

Wash. Dip in boiling water for 15 to 20 seconds or until skins split, then dip in cold water. Slip off skins and remove cores. Leave whole or cut in halves. Pack in jars, allow ½ in. headspace, pressing gently to fill spaces or add hot tomato juice. Do not add water. Add one teaspoon salt per quart. Adjust lids. Process pints 35 minutes, and quarts 45 minutes in boiling water canner.

hot pak

Prepare tomatoes as for raw pak. Cut in halves and bring to a boil; stir to prevent sticking. Pack boiling hot into jars allowing ½ in. headspace. Add one teaspoon salt per quart. Adjust lids. Process pints for 35 minutes, quarts 45 minutes in a boiling water canner.

Roma Tomato Sauce

Wash, remove stems and trim off any bruised or discolored portions. Cut in halves or quarters. Place into pot and heat to boiling, stirring constantly to prevent sticking. Allow to boil for approximately five minutes. Remove from heat and strain to remove excess water. Press the hot cooked tomatoes through a food mill or a Victoria strainer to remove skins and seeds. Place the sauce into large diameter pot and start simmering. Stir in one cup of chopped fresh sweet basil to 12-quart pot. Allow to simmer for one hour, stirring constantly.

Wash jars in hot sudsy water and rinse well. Also wash and rinse metal screw bands. Place jars in oven at 200°F for 15 minutes to sterilize. Assemble metal lids with sealing compound into metal screw bands. Place assembled lids in sauce pan with open end up so that center of lids do not fall out. Fill pan with water and heat to boiling point. Allow to boil for 10 minutes to sterilize lids; continue boiling as lids are removed for use.

With a pair of tongs, remove one jar at a time from heated oven. Add one teaspoon of salt and fill with the boiling sauce. Allow ½ in. headspace. Wipe off top of jar and screw band. Pick up an assembled screw band and lid from the pan and assemble to jar. Screw down as tightly as possible by hand. Place jars on a wooden surface and cover immediately with a towel or heavy cloth. Keep jars away from draft.

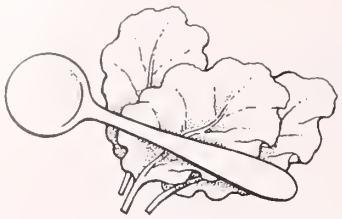
Continue above process until sauce pot is empty. Leave jars covered for 24 hours. Remove screw band; label and store in a cool dark place.

Please note that the above method requires no further processing in a boiling water canner after jars have been filled and sealed. The author has processed sauce by this method for the past 40 years without any spoilage or deterioration. Some jars have been kept for as long as 5 years without any spoilage or deterioration.

Pat Feola

Pat Feola's Roma tomatoes are descended from ancestors brought over from Italy by his grandfather around 1902. Seeds were passed on to his father and grown on their farm in Waterford, NJ and later in Feola's garden in Lawndale in Northeast Philadelphia. A retired mechanical engineer, Pat Feola gardens extensively on a 50 ft. x 80 ft. patch. He harvests vegetables and fruits, coverting the blackberries and raspberries into cordials and grapes into wine. You'll be reading more about his fruit trees in the July issue.

continued



Transforming the American Produce for Russian and Puerto Rican Cuisine

Russian Cuisine

Tatiana Bembischew grew up working in the gardens of a collective farm in the Soviet Union.

Tatiana, who left Russia 40 years ago, now has a garden in multi-ethnic West Kensington. The garden is a tribute to the ingenuity born of a lifetime of courageous coping and proud improvising. Its narrow curving paths are made of tiles and marble slabs salvaged from abandoned houses in the area. Its fertilizer comes from many walking trips to the nearest police horse barns. Its seeds come from last year's crops. A sturdy peach tree grew with startling speed, like Jack's beanstalk, nurtured from the compost.

Everything Tatiana cooks contains something from her garden – vegetables, fruits, herbs.

Tatiana's recipes are from her culture, but not from her childhood. "When we used to live in Russia, my family was very poor. My mother work all the time on collective. My father too, until he went to war. We all work, whole family, all year. We did not need recipes for cooking because we not have so much to cook with. We cook a lot of turnips, baking them like potatoes. In summer we make "vinaigrette" with boiled beets, or boiled potatoes, onions, carrots, celery, beans, peas, cucumbers – whatever we have – and fresh sauerkraut. I still make that in summer."

And, of course, from the beets that Tatiana grows comes her borscht.

Borscht

Boil about 1 lb. stewing beef and bones in two quarts of water. Cook until tender. Cook slowly in small amount of water:

4 or 5 beets, sliced
3-4 carrots
4-5 middle sized potatoes
1 parsnip sliced
Dill

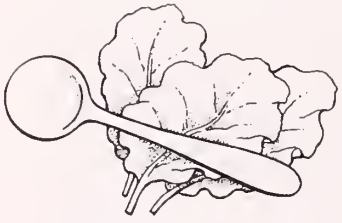
After about 15 minutes, add shredded cabbage. How much? "Depends how much you want. You can put whole head if you want. Or you can put half a head."

Fry some onions with some chopped celery and fresh tomatoes and "put them in." Add some salt.

Add everything to meat. Cook until vegetables are done. In last two seconds add some garlic.

We asked about sour cream. "Sometimes we have it in the house. If we have, who like it can have it, who doesn't like it doesn't have it."

Natalie Kempner



Puerto Rico

"I tell people, 'Don't ring my doorbell; knock on my garden gate.'" This is Tomasita Romero, who planted her first Philadelphia garden in summer 1980 in a vacant lot at 2224 N. 2nd St. She is already an enthusiastic member of the Philadelphia Green Advisory Board.

"Summer here is too short to grow all the things we grow in Puerto Rico, but tomatoes, beans, pumpkins, corn, eggplant, peppers, garlic, onions are basic in our cooking, and I grew them all. I tell you, it was really a crop! We had tomatoes for the whole block!" Tomasita used her "pilón" (wooden mortar) to blend tomatoes with garlic, peppers, onions and oregano and froze enough to provide her with tomato sauce all through the winter.

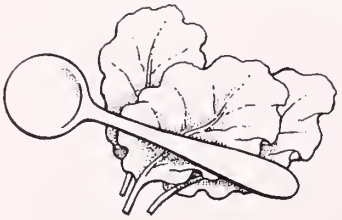
Bacalao con Berenjena)
(Codfish with Eggplant)

4 Tbsp. oil
2 small eggplants
2 green peppers
2 small onions
1 lb. codfish
1 cup tomato sauce (1 can)
pinch oregano
salt/pepper to taste

Break codfish in pieces and soak in water to get rid of salt. Cut eggplant, peppers, onion in small pieces. Put them in frying pan with oil. Add codfish, tomato sauce, seasonings. Simmer about one hour or until eggplant is tender.

"We eat this a lot, especially during Lent. It goes with everything — yellow rice, white rice, yams, potatoes . . ." Tomasita served it to us over slices of boiled plátanos (large green bananas – plantains – available in Spanish grocery stores) and chunks of boiled "calabaza" from her garden. "Calabaza" is the Spanish word for both squash and pumpkin. In English, Tomasita calls what she served "Spanish pumpkin." It is a large squash, yellow and green on the outside, orange inside. She grew hers from "the seeds of one I bought in the Korean market on Front Street."

Natalie Kempner



Ethnic Gardening at Friends Hospital

The pickle passion is very evident in our ethnic garden at Friends Hospital. Harvesting the bumper crops created some interesting experiences. One year the cucumber vines trailed down the side of a hillside and the only way we could pick and harvest from those vines was to have one person "toss" them up to a "catcher." More than one good Kirby

landed in our cold frame, but fun and repartee were a meaningful by-product. The Kirbys also could take the abuse.

In preserving our harvest, the following pickle recipe uses many techniques. They are dilled, spiced, soured and fermented through processing. Other possibilities, of course, are endless. As a child, I watched the "purist" use a brining and fermentation process, but when I described that process to some of our gardeners, they reacted negatively. They could well accept the preparation of the brine mixture, they could even accept the placing of their nice crunchy crisp Kirbys into a crock or small barrel, but the fact that the vegetables were to be submerged and then weighted down and there would be a scum forming on top and ringing the brine was hard to sell. It is also a longer process, and when the gratification level is acute that's important. The following recipe is our compromise.

Inventiveness, always our strong point, coupled with the many ethnic backgrounds that are in our "melting pot" at the hospital, has made us aware of deep-rooted family preferences and selections of traditional foods. We all know that the Greek, Italian and Eastern European cuisines use many of the same crops as we do right here in the Delaware Valley, even many similar recipes, only giving them different "titles" and serving them in different sequence during the course of a meal. We almost started another world war, when two patients, one of Greek background, and another of Russian-Jewish background sampled the following recipe. One called it Greek Eggplant Salad, and the other gave it a more colorful title, calling it Eggplant Caviar. A debate ensued as to whether you serve it as an hors´ d'oeuvre, an appetizer or a main luncheon salad. A "Food Peace Treaty" was signed when all the patients in the group sampled and devoured the results.

Eggplant "Caviar" Appetizer

1 large eggplant
1 medium onion, chopped
½ green pepper, chopped
2 tbsp. each olive oil and butter or margarine
1 large tomato, peeled and chopped
2 tbsp. lemon juice
1 tbsp. catsup
½ tsp. Worcestershire
¼ tsp. salt
Dash pepper
Dill weed, chopped chives, or chopped parsley for garnish
Black olives for garnish

Place whole eggplant in a shallow, greased baking pan and bake in a 400° oven until soft (about 20 minutes). Remove and cool slightly. Then peel it and coarsely chop the pulp. In a frying pan, sauté the onion and green pepper in the olive oil and butter until vegetables are tender but not browned. Add the chopped eggplant, tomato, lemon juice, catsup, Worcestershire, salt and pepper. Cook over high heat, stirring until liquid is cooked away; cool.

Spoon into shallow serving dish; sprinkle with dill weed, chopped chives, or chopped parsley. Garnish with black olives.

(Editor's Note: What, no garlic!)

Kosher Dill Pickles

30 cucumbers
½ cup coarse kosher salt
2 quarts water
2 tbsp. vinegar
4 cloves garlic
4 bay leaves
¼ tsp. mustard seed
1 tsp. mixed pickling spice
10 sprigs dill

Use even-sized cucumbers and be sure they are very firm. Wash and dry them. Arrange the cucumbers in a crock or jar.

Bring the salt and water to a boil. Cool; then add the vinegar, garlic, bay leaves, mustard seed and pickling spice. Pour over the cucumbers. Arrange the dill over all. The liquid should completely cover the cucumbers; if not, add more salted water. If a crock is used, cover with a plate or wooden board to weight it down. Loosely cover with cheesecloth. Keep in a cool place for a week. If you like very green pickles, you might test one at the end of five days.

Ratatouille
(Rah-tah-too-yeh)

½ cup (approx.) olive oil
2 large onions, sliced
2 large cloves garlic, minced or mashed
1 medium-sized eggplant, cut in ½ in. cubes
6 medium-sized zucchini, thickly sliced
2 green or red bell peppers, seeded and cut in chunks
2 tsp. (approx.) salt
1 tsp. basil leaves
½ cup minced parsley
4 large tomatoes, cut in chunks
Parsley and sliced tomato (optional) for garnish

Heat ¼ cup of the oil in a large frying pan over high heat. Add onions and garlic and cook, stirring until onions are limp but not browned. Stir in the eggplant, zucchini, peppers, salt, basil, and minced parsley; add a little of the oil as needed to keep the vegetables from sticking. Cover pan and cook over moderate heat (about 30 minutes); stir occasionally, using a large spatula and turning the vegetables to help preserve their shape. If mixture becomes quite soupy during this time, remove cover to allow some of the moisture to escape.

Add the tomatoes to the vegetables in the pan and stir to blend. Add more oil if vegetables are sticking. Cover and cook over moderate heat for 15 minutes; stir occasionally. Again, if mixture becomes quite soupy during this period, remove cover and allow moisture to evaporate. Ratatouille should have a little free liquid but still be of a good spoon-and-serve consistency. Add more salt if desired. Serve hot or cover and chill to serve cold; reheat to serve. Garnish with parsley and tomato. Makes 8 to 10 servings.

ratatouille in the oven

Using the vegetables and seasonings in the above recipe, layer all ingredients into a 6-quart casserole, pressing down to make fit. Drizzle only 4 tablespoons of the olive oil over top layer. Cover casserole and bake in a 350° oven 3 hours. Baste top occasionally with some of the liquid. Uncover during the last hour if quite soupy; this method of cooking makes a moist ratatouille. Mix gently and salt to taste. Serve hot, chilled, or reheated. Garnish with parsley and tomato.

Mona Dwork Gold

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Mona Dwork Gold is supervising director of Horticultural Therapy at Friends Hospital. She serves on the PHS Council and Flower Show Executive Committee.

Understanding Bonsai

This article was prepared by the Bonsai Exhibit group of the Pennsylvania Bonsai Society for visitors to the Society's exhibit in the Philadelphia Flower Show and others interested in basic information. The bonsai in the illustrations belong to members of the Pennsylvania Bonsai Society.

Growing bonsai is a hobby for the dedicated horticulturist. The techniques can be learned through texts or classes. But only a person who truly loves plants will give the little trees the care and attention they need in order to present an attractive appearance.

The Pennsylvania Bonsai Society has put together this general background, with suggestions as to how to proceed if you want to learn more. We haven't included a complete history or even complete details on technique. Rather, we've collected some observations that may help gardeners, growers and other interested people to understand this specialized field of horticultural endeavor.

Appearance. Bonsai should be decorative, and they should reflect the beauty of nature. Some are stately, suggesting the perfection of a tree that has grown for years in a sheltered place. Others are young and vigorous like a grove of saplings in the spring. Still others and perhaps the largest group replicate the struggle of a tree to survive in a hostile environment. (Familiar examples in nature are the much-photographed Jeffrey pine above Yosemite and the Monterey cypresses at Pebble Beach.) But even these weather-beaten types should be pleasing to the eye. Bonsai should never be grotesque.

A successful bonsai, like a successful painting, is not simply a replica of the natural object. In both bonsai and painting, nature is reworked by the artist. A thick, twisted and tapered trunk creates an impression of age. A full crown with many branches and twigs suggest maturity. Exposed roots and dead, whitened branches portray struggle. A straight trunk with regularly spaced limbs mirrors the symmetry of the perfect specimen. Such features as these may seem exaggerated, but so are the enlarged photographs of bark, leaves and flowers in our horticultural magazines. There can be no emphasis without some exaggeration.

Age. Age for its own sake is not one of the objectives of bonsai. Prizes are not given for the oldest tree. Yet age plays an important part, artistically and psychologically. The lines and scars of age give character to a tree as to a person. People stand in awe of very old living things – turtles and parrots in the zoo, sequoias and bristlecone pines, and 300-year-old bonsai, as well. Growers can simulate the effects of age to a remarkable degree.

Yet there is no mistaking the real thing.

Another fascinating aspect of ancient bonsai is the care that has gone into them. A century of care means 35,000 days of watering. It entails perhaps 300 complete prunings and 2,500 rounds of nipping and pinching buds. In the course of 100 years the tree will have been repotted and root-pruned at least 75 times.

Horticultural Principles. There is no magic in growing bonsai. The techniques follow logically from basic horticulture. Thus:

(a) A tree manufactures carbohydrates for growth by photosynthesis – which takes place in the leaves. Photosynthesis is reduced and growth is retarded by making the leaf area smaller through pruning and pinching.

(b) Trees use water for photosynthesis and transpiration, i.e., evaporation through the leaves. The water for these functions is taken up by the roots. When the leaf area is reduced, the root system can also be reduced, which enables the plant to live in a shallow pot.

(c) Leaves and shoots are replenished each year with new growth from buds. In a tree that is growing freely, new growth develops from terminal buds on the ends of existing twigs, and the tree grows larger. But if the terminal buds are pinched off, new buds will develop below the cut, i.e., within the outline of the tree. The same is true of roots. Thus it is possible to maintain the size of the tree and its root ball by pruning both the branches and the roots.

(d) When the terminal bud of a twig is removed, the replacement bud develops on the side, not on the end, and this changes the direction of growth. Also, when a branch is held in one position for a long period (as the branches of a mountain tree are depressed by the winter snows), it remains in that position even after the restraining force is removed. Bonsai are shaped by the application of these two principles. Repeated pruning controls the shape and size of the branches and produces a network of fine twigs. More drastic changes are produced by winding copper wire in a spiral around the branch and bending it to the desired position, where the wire will hold it until the new position becomes permanent.

Species. Any species of tree or woody shrub can be grown as a bonsai. The most satisfactory are those with small leaves (or short needles in the case of pines and similar evergreens) and a naturally short distance between the buds. The Japanese used plants native to their islands: five-needle pines, Sargent's juniper, trident maples, cherries, quince, azaleas, zelkova, hornbeam, and the like. Americans can use plants found in local hills and nurseries. Also, if you can grow house plants, you can train subtropical and tropical species: figs, citrus, gardenia, Monterey cypress, olives, and so forth.

Care. Bonsai are demanding. They must be watered every day in the growing season. During the summer many of them need protection from drying winds and direct sun. In winter they should be shielded from the wind and from abrupt changes in temperature, and their rootballs should not fall below, say, 25°. A deep, shaded cold frame where the pots can be sunk into the ground affords almost ideal conditions.

In addition, the plants require root pruning and repotting, generally once a year; a complete pruning once or twice a year; and frequent pinching during the active growing season. Above all, they need attention. The bonsai grower must



photos by Ralph Walker

Collected specimen, *Juniperus* sp., driftwood style.



Group planting. *Juniperus chinensis* 'Robusta Green'

be alert to notice the first sign of trouble.

Development in China and Japan. The origins of bonsai are to be found in China, where trees and shrubs have been grown in highly decorative containers for many centuries. More recently, i.e., two or three hundred years ago, the idea of a tree in a pot migrated to Japan, where it evolved into the form we know today.

In the course of this evolution, notable changes occurred. Japanese containers are much less showy than Chinese. Japanese trees are much more finished. The Japanese approach is to harmonize the size and depth of the pot with the height of the tree and the thickness of its trunk; the color and texture of the pot with the color and density of the foliage; and the placement of the tree in the pot with the shape of the tree, all with a view to creating a unified aesthetic effect.

While many aesthetic themes can be detected today, the prototype is the mountain scene. The Japanese, as well as the Chinese, are blessed with picturesque mountains, which they have long portrayed in scrolls, drawings and ceramics. From pictures, it was but a small step to the tree itself. What better way to capture the mountain experience than to transplant a specimen tree that has been shaped and dwarfed by mountain gales, winter snows, impoverished soil and short growing seasons? The lure of such collected specimens is irresistible. Collectors are pursuing them today, not only in Japan, but in the Sierras, Cascades, San Bernardinos and Rockies in this country.

But collecting is time consuming. The supply of collected trees is limited, and prices are high. So professional growers found ways to produce similar results from nursery stock. This is the source of most bonsai today.

Development in the United States. Bonsai made their first official appearance in the United States early in this century when Lars Anderson, our Ambassador to Japan, imported an impressive collection, which is still to be seen in the Arnold Arboretum. However, the actual growing and training of trees was confined for many years to a handful of Japanese-Americans on the West Coast. The real flowering of interest dates from the exposure of American servicemen to Japan following World War II.

Today there are fine public displays in the National Arboretum in Washington (a bicentennial gift from Japan), the Brooklyn Botanical Garden, and Longwood Gardens. There are centers of activity in Philadelphia, New York, Washington, Atlanta, Los Angeles, San Francisco, Seattle, and many other areas. There are two national societies, the American Bonsai Society and Bonsai Clubs International, and many local organizations. Bonsai fanciers are to be found in every region of the country.

If you are interested. There are many books on bonsai, ranging from how-to manuals to photographic essays. A comprehensive collection is to be found in the library of the Pennsylvania Horticultural Society. The librarian can help you select titles that are responsive to your interests.

If you decide to try your hand, books should not be your sole guide. The only satisfactory way to learn how to shape and grow bonsai is to take lessons, go to classes, attend demonstrations and get in touch with people in the field. Joining the local society is a good way to begin.

The important thing is not to become discouraged. The art of bonsai is complex and subtle. The techniques are demanding. The trees develop slowly.

continued

Understanding Bonsai

continued

photos by Edmund B. Gilchrist, Jr.



Virginia live oak *(Quercus virginiana)*



Deciduous azalea, *Rhododendron* Satzuki

No one can rush the process. On the other hand, bonsai provide the joy of endless unfolding. Every time you water your trees, you will glimpse new possibilities and achieve new understandings. Every time you take a walk in the country, you will find your appreciation of nature enriched by your study of bonsai.

Membership

Pennsylvania Bonsai Society
c/o Pennsylvania Horticultural Society
325 Walnut Street
Philadelphia, PA 19106

Lectures and Courses

Rosade Bonsai Studio
Box 303, Ely Road
R.D. 1
New Hope, PA 18938
862-5925

Dorothy S. Young
P.O. Box 305
McKean Road
Spring House, PA 19147
646-4093
(Dorothy Young's book, *Bonsai: A Basic Manual,* will be published by Prentice Hall sometime early in 1983.)

Books

The Art of Training Plants. Ernesta D. Ballard. 128pp. c1962
This book on training decorative plants is also the first book by an American to provide information on bonsai. Translates bonsai culture into familiar horticultural techniques. Still the best on indoor bonsai. Plant list. Index. A classic.

The Beginner's Guide to American Bonsai. Jerald P. Stowell. 140pp. c1978
A readable, well-illustrated account of an American Master's experience and personal collection. All phases of the art and technique of bonsai are covered. Index.

Bonsai for Americans. George F. Hull. 256pp. c1964
Japanese bonsai techniques adapted to American trees and growing conditions. Lively and readable. Plant list. Index.

Bonsai Indoors and Out. Jerald P. Stowell. 134pp. c1966
The experiences of a dedicated bonsai hobbyist growing bonsai in Northeastern U.S. Chapter on tender plants for indoor bonsai. Index.

Bonsai: Miniature Potted Trees. Kyuzo Murata. 114pp. c1964
Instructive guide for growing and enjoying bonsai by Japan's most venerable master. Detailed information for many bonsai species. No index.

Bonsai Miniatures. Zeko Nakamura. 62pp. c1973
A "quick and easy" approach to enjoyment of the smallest bonsai, less than six inches. Packed with information and color photographs. No index.

Bonsai-Saikei. Toshio Kawamoto and Joseph Y. Kurihara. 362pp. c1963
The best self-teacher of Japanese bonsai, saikei (miniature tree and rock landscapes), and gardens. Extensive instructional drawings. Emphasis on horticulture and fundamentals. A classic. Index.

Bonsai Techniques. John Yoshio Naka. 262pp. c1973
Japanese-American bonsai master details precise techniques, mathematical ratios, care and major Japanese styles. Encylopedic, well illustrated. No index. A classic.

Bonsai: Trees and Shrubs. Lynn R. Perry. 234pp. c1964
American horticulturist and student of Kyuzo Murata in Japan describes his bonsai methods and techniques. Specific instructions for over 50 trees. Well indexed.

Commemorative Album, Marking 25 Years of Bonsai Instruction. Yuji Yoshimura. 64pp. c1977
First American instructional book on refinement of specimen bonsai with photos in sequence over 10-year period or longer. Care and training information on 40 species for bonsai.

Grand View of Japanese Bonsai. Japan Bonsai Society, Inc., comp. and Yuji Yoshimura, translator. 352pp. c1972
Large format color photographs of 300 contemporary Japanese bonsai by seasons and styles. Brief descriptive text. Beautifully printed. Index.

Brooklyn Botanic Garden. Series of 3 handbooks: *Handbook on Dwarfed Potted Trees: the Bonsai of Japan.* 97pp. c1959; *Handbook on Bonsai: Special Techniques.* 89pp. c1966; *Bonsai for Indoors.* 77pp. c1976
Well-illustrated popular guides with a wide range of information on bonsai.

Man Lung Artistic Pot Plants. Yee-sun Wu. 355pp. c1969, revised 1974
The only book in English on Chinese bonsai: styles, techniques, plant materials and care. Over 300 photographs including color from collection of author, noted bonsai fancier and financier. No index. A classic.

Miniature Trees and Landscapes. Yuji Yoshimura and Giovanna M. Halford. 220pp. c1957
First bonsai book in English authored by Japanese bonsai master. Authentic, specific, and thorough. Appendix with basic data on 340 bonsai plants. Excellent index. A classic.

How Do You Design A Flower Show···Carefully!

by Ed Lindemann

The question I am most often asked is "How do you design the Flower Show?" If I answered with one word it would be "logistically." Two major elements are involved in planning the design, people and plants. While I don't know offhand how many plants will be in the Show, I do know that there will be about 230,000 visitors, 1,000 volunteers and staff and approximately 500 exhibitors. The safety, traffic flow, comfort and entertainment of a quarter million people becomes a top priority.

The Flower Show is show business. To be sucessful in show business you have to be better than the next performer, and you have to have a gimmick. We are lucky at the Philadelphia Show because horticulturally we are better than almost anyone else. The quality of the exhibits from individual flower arrangements and horticultural entries to the largest nursery exhibit on the floor is far better than can be seen anywhere else in North America. What about the gimmick? For me, the gimmick is the theme. Once I have a good central theme I am halfway there. A new theme each year automatically gives the Show a fresh appeal. It sparks interest in the audience and Flower Show family.

At the Flower Show, in contrast to the theater, the cast and stage are static and the audience moves. The most important single aspect of the floor plan is the movement of 20-30,000 visitors each day. Through surveys and analysis, we know that the majority of people entering the Show will travel counterclockwise. We know that major aisles must be 15 ft. to 20 ft. wide and minor side aisles must be 10 ft. to 15 ft. wide. We've learned that more short aisles are better than fewer long aisles and that curved aisles move people faster and easier than straight aisles. With past experience in tow, the first thing I do on paper is to design the layout of aisles and a traffic pattern. In addition to Show visitors, we must be concerned about the traffic needs of exhibitors during setup, daily "back stage" maintenance and dismantling.

Next we go for the gimmick. We want to "wow" our visitors. When they descend that escalator I'd like to completely transport them from the drab March landscape left behind. In the theater the lights dim, the overture begins, the curtain rises and the show is on. At the Flower Show, the escalator moves the audience from a stark lobby into the Show, engulfing them in masses of color, perfume, sound and movement. The entrance feature becomes my overture, it sets the mood and the theme. Splashes of color, dancing fountains, wonderful scents of hyacinth and gardenia are the elements to work with. It develops into a combination of exquisite horticulture, razzle-dazzle, fantasy and whimsy; it presents the topiary carousel, the waterlily lake and, this year, the orchid lagoon.

After the traffic and aisles are worked out and the entrance feature is placed comes "act one" or the central feature of the Show. It is here that I work closely with the Show's theme. The central feature may be staged entirely by the Pennsylvania Horticultural Society, producers of the Show, or it may be a combined effort of several exhibitors who have been invited to participate in this area. In 1981 our central feature was "An Old Pennsylvania Canal Town." Nine of our major exhibitors were asked to create together a street scene similar to one found in any of the tiny towns clinging to the banks of the Pennsylvania canal as it winds its way through Bucks County. Our exhibitors came through with the perfect Main Street complete with apothecary, antique shop, inn, artist studio, gift shop, traveling circus and bandstand on the town common. All we needed was a canal and barge. We went looking in New Hope, Pennsylvania. The owners of the New Hope Barge Company were more than happy to lend us one of their barges. After carefully measuring the barge we agreed that it was just too large for the Show. So we built a slightly scaled-down version whose proportions were perfect in the Civic Center. We added the street of shops, old-fashioned lamp posts, canal, and decorated the barge for an evening dinner party. Jim and Bianca, two mules who pull the barges on the canal in Bucks County, came to the Show, adding authenticity.

Bridges, barges, columns and canals, fountains, falls, fences and facades, the Taj Mahal or snow-covered woods. We will find a way to buy it, build it, borrow it or fake it.

One of the reasons it works is the rapport between everyone working on the Show: the Executive Committee, volunteers, exhibitors, staff and crew. Each individual is an equally important link in the chain to success. Yet there is one person who probably knows more about flower show design and staging than anyone. He calls himself a "perennial"; we all think of him as the Cecil B. DeMille of the flower show world. J. Liddon Pennock, Jr. excels in attention to detail. We may work futilely for hours on a section of the Show. He will walk onto the floor and in one quick glance give the solution to the problem.

The exhibitors not included in the entrance and central exhibits constitute the rest of the cast. The nurseries, florists, plant societies, and other exhibitors are placed on the floor in a manner that shows them to best advantage. It doesn't work to have the florists together, or two nurseries that specialize in wildflowers together. Exhibitors who work with tall material and need height are given locations where the ceiling is highest. Some areas on the floor are colder because they are close to the outside gates. These areas can cause problems for exhibitors with tropical plants. After space assignments are given out, individual exhibitor plans are subsequently submitted for committee review. Some spaces may need changing for the best overall effect. Our exhibitors are a close knit family and such changes usually work out very smoothly.

The next task is to work out a script. Our script becomes a detailed manual for the coordination and orchestration of the entire production. Every detail must be worked out in advance. Every plan must be drawn to scale and reviewed to make sure it will fit.

Staging and props must be designed and ordered. We can't think of anything as being impossible. Bridges, barges, columns and canals, fountains, falls, fences and facades, the Taj Mahal or snow covered woods. We will find a way

continued

How Do You Design A Flower Show···Carefully!

continued



photo by Albert W. Vick, Jr.

Allied Florists of Delaware Valley decorated the Society's barge for a party on the canal. With a little imagination you can almost hear the bullfrogs croaking among the cattails.

to buy it, build it, borrow it or fake it. Electrical and water needs are worked out. A schedule for setting up and tearing down developed. When do we want the moving vans to come? When can the floor be marked and the mulch delivered? Which exhibitors should move in first and which will be able to work around others? It simply becomes a matter of logistics.

Once the casting and script are completed we get into production. The Flower Show Executive Committee and the Flower Show Design Committee review all of the plans. Every detail is re-examined. What bulb wattage is needed for the new pedestal classes? A new style of lettering is needed for exhibitors' signs. At what temperature should the huge hall be kept? Color samples, number of telephones, how many restroom signs with left-hand arrows? A crop failure: where can we find 1,500 white primroses in full bloom in late February?

We don't get much chance for rehearsal in the flower show business. We go straight from paper design to the real thing. About a week before opening I mark the floor of the Civic Center. I use chalk and convert the scale drawing blueprint to full size dimensions on the concrete floor. Like chalk marks on a stage these marks guide our exhibitors to their respective locations. One year an extremely tight move in schedule necessitated marking the floor from midnight to dawn. Fortunately a friend volunteered to assist. We worked through the night in that awesome concrete cavern almost five acres in size. It was an eerie experience as we wandered with buckets of chalk almost losing sight of each other in the dim vastness of the empty Civic Center. At 4:30 a.m. a convoy of 24 tractor trailers filled with mulch arrived. Like a great snake they circled the Civic Center's snow-covered driveways. These men had driven all night. We visit over hot coffee as each load of mulch is dumped on a specific spot on the floor. By 6:00 a.m. the first nurserymen arrive and we move into full gear.

The next five days are unbelievable. Everything starts to work towards a unified result: the Show. All the meetings, the decisions, the sleepless nights, the anxiety – it's all worth it. The setup time is intense with thousands of questions, each equally important to each individual exhibitor.

The pace quickens and a careful eye is needed to insure that in the last minute rush all standards are maintained. The floor manager, assistant floor manager and Flower Show crew work in unison with the designer in coordinating all of the final details: a cherry picker propels the electricians 30 feet above the floor, signs are hung, waste cans placed and assigned duties rehearsed. Pools are filled and they leak, pumps are plugged in and they don't squirt. Light bulbs blow out and a gazebo filled with plants collapses.

We laugh and we cry!

Opening night arrives and the Show goes on, always a miracle, no matter how many times you have watched it happen. Once the Show opens to the public its operation is similar to that of a well run hotel or ocean liner. The daily operation, while routine, must never seem bothersome. Every visitor is equally as important and deserves the same quality.

With the lights up and the cast in action the designer slips to the wings, but the job isn't over. It is now time to evaluate. Hours are spent watching the traffic, critiquing the colors, the lighting, not enough height, background music too fast, temperature too cold at night.

Note after note is made: arrangement staging, major exhibitors, membership booth, food services and on and on. On the day before the Show closes, the Flower Show Committee and staff get together to pool their notes and suggestions for future Shows. When I get back to the drawing board these notes come out of the file and become a valuable resource in designing the next Show. No, not next year's; we start 18 months in advance so 1983 is already well into the planning stages on paper. There will be a lot of revisions, but we have got to start thinking about '84. It will be here before you know it. As the words from the song go, "let's get on with the show"!

in the beginning . . .

The Pennsylvania Horticultural Society's first Flower Show in 1829 was also the first flower show in America. Over the years the Show was sponsored by a number of groups, the most prominent of which was Philadelphia Flower Show, Inc. This group sponsored the Show from 1927 to 1964, using a variety of designers.

In 1965, the Society assumed its sponsorship under the direction of Ernesta D. Ballard at the Armory of the First City Troop. Evelyn Hett was on hand to work with Ballard. The following year, James P. McCarvill joined the team and the Show moved to Convention Hall and later to the new Civic Center. Under Ballard's direction, the staff and Flower Show Committee designed the Show. In 1967 and 1968, architect Vincent Kling designed the Show, and from 1969-72 Ed Semanko of Semanko-Bobrowicz did the honors. From 1973 to 1976 the staff, under the direction of Ballard, in association with J. Liddon Pennock, Jr. and Henry Mirick, worked on the design. In 1976, John Kistler, landscape architect, designed the Show and continued through 1979. In 1980, Ed Lindemann was named designer.

●

PHS horticulturist Ed Lindemann has designed the 1980, '81 and '82 Shows. His combined interest and training in both art and horticulture are used in planning this annual event.

PAIN~FREE GARDENING

by Barbara Blackwood Bricks

Gardeners will gladly attest to the psychic well-being and the measurable physical gains, such as improved circulation and greater strength and endurance, derived from gardening. Who among us hasn't spent a few extra hours in the garden, or carted just one extra wheelbarrow load, or in some manner forced ourselves beyond our limit and paid dearly with aching muscles and joints?

Our often under-exerted winter muscles are especially vulnerable to damage during the spring and early summer when we first return to outdoor work. In our enthusiasm to take advantage of those first warm days we are beguiled into working longer than we might normally. The penalty for one day's zealotry can be days or even weeks of painful reminders that we did not physically prepare for our work.

Most wise gardeners consider soil preparation an integral part of their planning, but seldom consider preparing their bodies for the demands gardening makes of them. Properly stretching your muscles before beginning work is wise. The key word here is *properly,* not *stretching,* for overdoing the stretching can easily cause the very damage you seek to prevent. Stretch only as far as you are comfortable and never to a point of actual pain. Some athletic enthusiasts bounce back and forth to extend the stretch. *Never* bounce. The point of stretching is to lengthen the muscle and make it limber; bouncing can cause the muscle to contract, or can tear the connective tissue.

Prolonged use of an aerosol pruning sealer left me with a very bad hand cramp for several months. Now I buy small cans if I must use an aerosol or pump-action product.

Pay close attention to your work habits and alter those that may continually stress one part of the body. If you are doing a lot of spading and always push with the right root, try switching to the left foot. If you normally plant by moving from left to right down a row, try moving from right to left on alternate rows.

Always avoid a locked-knee stance when lifting or bending. Bending the



knees, not the waist, use the thigh muscles to lift you and the object you're lifting. Keep the spine straight. When carrying a heavy load, grasp the object with both hands and lift with both hands;



avoid bearing the weight on only one side of the body or on a hip. Grasping heavy weights with only one hand can cause an arthritic-type condition that can be especially painful and difficult to alleviate. Prolonged use of an aerosol pruning sealer left me with a very bad hand cramp for several months. Now I buy small cans if I must use an aerosol or pump-action product. Although bigger may be cheaper it is not a bargain for me, because my hands are not strong enough to bear the combined weight and strain necessary to suppress the nozzle. Holding hand tools for long periods in cold or damp weather can cause cramps afterwards. Wearing heavier gloves or just switching to a tool with a different handle can help.

In spite of every precaution we can still end up with unexpected injuries. I was surprised recently, not having picked up a racket in three years, to find myself with a good case of tennis elbow. It occurred after a few hours spading in the garden turning over the soil, which required a rotating motion of the right



forearm. Your goal with this type injury should be to reduce inflammation of the joint. Use an ice pack as soon as you realize the damage. *Do not* use heat initially; heat will only increase the swelling. Keep the ice pack in place for 15-20 minutes, off for 20 minutes and back on for another 20 minutes. If you wish, heat can be used after the first day.

Watch your breathing and avoid extended periods of cramped positions. Leaning over for a long time can inhibit the diaphragm. I've sometimes found I have a "stitch" in my side after a long session of weeding or planting. This is the same kind of cramp runners experience and is caused by an accumulation of too much carbon dioxide and too little oxygen in the lungs. Placing the fingers of both hands under the lower ribs, press up and in against the diaphragm, bend

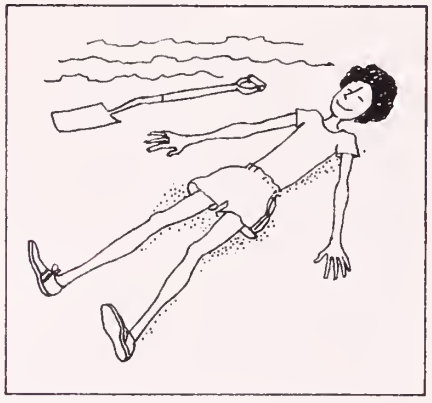


continued

from the waist, and exhale all the air from the lungs. You may need to repeat this several times before the pain disappears. Try to avoid that condition by altering positions frequently.

Do not remain in one position too long while performing any chore. For example, reaching and looking up to do overhead pruning or painting can pinch nerves in the back of the neck, causing loss of balance and in extreme cases blackouts. This can happen without your being aware of any loss of balance. I know of two instances where this problem has caused conscientious workers to fall off ladders with dire consequences.

Take periodic rests while doing some of the really heavy back-breaking chores, and stretch muscles by lying down for a few minutes. This allows the

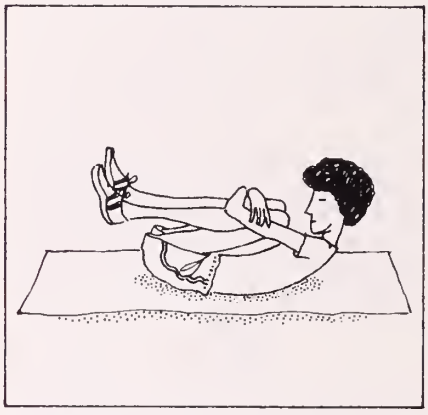


muscles that have been constantly contracting and tensing to relax and loosen up again.

A series of three simple exercises after finishing work can release the accumulated muscle tension in the lower back. It has been said that the price humans as a species pay for standing erect is to suffer chronic back pains. Certainly the lower back is one of the parts of the anatomy most susceptible to injury and fatigue. Usually injuries occur when placing too great a load on the back instead of using the legs and arms for leverage. One obvious solution is to strengthen those two areas. Another great help, no matter what your age or physical condition, is a few basic exercises. The exercises given here are simple, but they do work and in a surprisingly short period of time:

1. **Lower Back Rock.** Lie on your back on a firm surface (you may use an exercise mat, but do not use a bed). Keep the left leg straight and flat on the floor and raise the right leg to the chest. Using both arms hold your leg close to your chest and hold that position for five seconds. Reverse legs and repeat. Then raise both knees and hold them with your arms against your chest. Bring your chin to your chest. Hold for six seconds and rock back and forth on your spine five times.

Do ten of these two times a day.



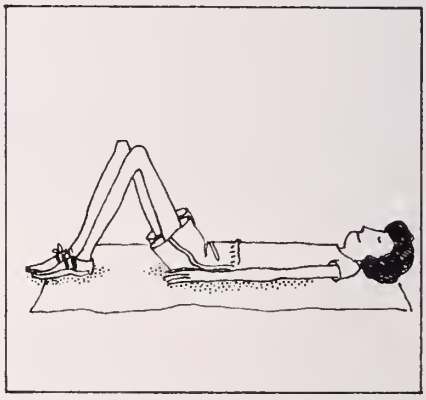
2. **Modified Sit-ups.** Lie on your back with knees bent and your feet flat on the floor. Fold your arms across your chest and lift your head and shoulders off the floor toward your waist until your shoulder blades are just off the floor. Hold three to five seconds. Relax.

Begin by doing 10 of these and gradually work up to 20, twice a day.



3. **Pelvic Tilt.** Lie on your back with knees bent and feet flat on the floor. Flatten the small of the back against the floor by straightening out the spine and tightening the stomach and buttocks; hold for five seconds. If you are more comfortable doing so, place your hand under the small of your back. Relax for five seconds and repeat. (When relaxing be careful not to arch your back.)

Start out by doing 10 of these and gradually work up to 20, twice a day.



You will find these exercises take 15 to 20 minutes, and the rewards you reap should make your gardening much more pleasurable. Not only have my husband and I found them successful but so have several friends. My father-in-law spent three days in bed, taking muscle relaxants for a muscle spasm in his back. Since beginning this series of exercises eight months ago he has had no recurrence of the problem. Do the exercises twice a day, ideally; you should notice a difference after as short a time as one week, and in four weeks should find endurance, flexibility, and strength greatly improved. *Stop* if you feel pain. Contrary to popular belief, it isn't true that something must hurt to be doing some good. Never push yourself beyond the point of comfort. However, to achieve maximum results, try to challenge yourself a small amount each day until you work up to 15 minutes per set.

Start out slowly rather than undertaking heavy tasks early in the day (or at the beginning of the season) and wind down at the end of the day rather than quitting abruptly. Muscles perform better with less stress after warming up. So save the big jobs for several hours into the work day. Ideally you should reverse the morning's process by repeating the stretching so that muscles that have become increasingly tight during the day are slowly stretched out to full length again and the accumulated tension released.

●

Barbara Blackwood Bricks is an artist and writer living in Chester County. She has been an active gardener all her life, with an interest in herbs and wildflowers.

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City gardener Barbara Truman returns from the back garden to her patio. These are only two of the five gardening areas that Barbara Truman created at her home. See page 13.



THE green scene

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Bluebells on the Brandywine.
See page 3.

THE
green scene
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Front cover: Bluebells on the Brandywine *(Mertensia virginica)*
photo by Jim Plyler, Jr.

Volume 10, Number 5 May/June 1982

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CAPTION CORRECTION FOR MARCH/APRIL ISSUE OF *GREEN SCENE*

Barbara Truman was pictured in the caption on page 13 of the March issue, not the author, Jane Pepper. Also, the reference to the author in the caption on page 15 in the same story was incorrect. The caption concerned Barbara Truman, not the author.

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GROWING NATIVE PLANTS FROM SEED

by Dot Plyler

A southern exposure, high shade from tall tulip trees and a generous sprinkling of boulders on a steep slope combined to create the perfect setting for a native plant garden. What better reason could we have had for choosing this site as the spot we wanted for our new home. When we moved in four years ago, we discovered an abundance of jack-in-the-pulpit, violets and touch-me-nots. Some blue phlox, cutleaf toothwort, dwarf ginseng, bloodroot, spring beauties, geraniums and ferns also grew on the bank. But the quantity and variety we wanted were lacking. The obvious solution was to grow our plants from seed. We've had successes and failures. If you'd like to increase your own native plant garden, perhaps you can profit from our experiences. Here are our recommendations for succeeding with some common, easy varieties.

Sterile potting or seed-starter soil bought from local garden centers is the best medium to use. Ordinary garden soil contains too many weed seeds. The weed seeds tend to germinate too rapidly and to smother the desirable plants. Store planted flats in a light place out of bright sunshine and keep moist.

bishop's cap and foamflower

Two delightful spring-flowering plants to grow from seed are bishop's cap *(Mitella diphylla)* and foamflower *(Tiarella cordifolia*)*. They're cooperative in every way. The seed is ready to collect in early June and stays on the plant for several weeks, enabling the gardener to gather it easily. Small plants appear from freshly sown seed in about 21 days and will be of blooming size the second year. These plants seem to have no insect pests or diseases and require only a lightly shaded area in good garden soil and occasional watering in dry weather. Year after year they can be counted on to push up their delicate white blooms in late April. *Tiarella cordifolia* is stoloniferous and can spread to create an attractive ground cover. However, there is a variety called *collina* (Wherry) which is not stoloniferous but may be divided. Germination for both *Tiarella* and *Mitella* is about 70%, but since many small seeds are produced on each plant, low germination is of no great concern.

phlox

In contrast, the early blooming *Phlox stolonifera* and *Phlox divaricata* could be considered "problem children" for seed collectors. When they are ripe, the seeds are catapulted from the mother plant in a mini-explosion. The only practical solution for the collector is to gather the nearly ripe seeds early in June, store them in a brown paper bag — plastic may foster mold — and enjoy the "pops" as the pods burst. Then plant as soon as possible. Flats should be kept outdoors over winter and kept moist; germination occurs the following spring. The second year plants will be of blooming size.



photo by Jim Plyler, Jr

Foamflower *(Tiarella cordifolia)*

bluebells

Our own Brandywine bluebells *(Mertensia virginica)*, so lovely in early spring, are another source of frustration to the seed gatherer. On Monday, they're green; on Wednesday, they're gone. Collect seed that has started to brown, as many as you can find and plant immediately. Germination will occur the following spring. Bluebells prefer a moist situation with some sun, preferably morning. Foliage dies down after blooming, so a fern cover is a good combination here.

columbine

The native columbine *(Aquilegia canadensis)* is a most satisfying plant: 10 fresh seeds planted on June 5, 1981, have yielded 10 small flourishing plants. Germination took place in about 21 days. These columbines will bloom next spring and should live for many years, increasing in size for the first several years. Columbines seem to love rocks and each one should have at least one "pet rock" of its very own. Possibly the rocks conserve moisture and help to keep the temperature uniform at the roots. Small flat stones about 5 in. wide and at least that long laid at the base of the plant will work beautifully.

bleeding heart

Seeds of *Dicentra eximia* are edged on one side by a whitish clear appendage called a "caruncle." According to some horticulturists, this caruncle must not be permitted to dry, or germination will be delayed or endangered. When our plants produced seed about the end of May, we conscientiously placed the seeds in a plastic bag containing moist sphagnum and put them in the refrigerator to await fall planting. About a month later, the sphagnum package was displaced by a jar of mayonnaise and sat unnoticed behind several cannisters on the kitchen counter. When discovered several weeks later, some of the seeds had begun to sprout. All were then planted in a flat and green leaves began to appear. This group of plants was small and tender when winter came. No cold frame or special protection, except a cover of leaves, was used. Losses were high.

continued

See "Tiarella – Foamflower" by Thomas Buchter, *Green Scene*, September, 1979.

GROWING NATIVE PLANTS FROM SEED

continued



photos by Jim Plyler, Jr

Phlox stolonifera



Columbine *(Aquilegia canadensis)*

In the meantime, *Dicentra* seeds with dry caruncles were given to us. These were placed, dry, in the refrigerator where they spent the winter. In April these seeds were planted outside in a flat. Surprisingly good germination occurred and several dozen young plants have now gone to permanent locations. A few first year plants are even blooming.

Dicentra has one of the longest blooming periods of any native plant. Even when there are no blossoms, the foliage is most attractive. The white-flowered ones in our garden appear to be more robust and to set more seed than the pink flowered.

amsonia

Someone wrote that fresh seed of *Amsonia tabernaemontana* will germinate in three to five days, so in July 1980 we carefully planted fresh seed from our mature plant and watched eagerly for seedlings. At the end of a week no plants had appeared – enthusiasm diminished, and after four weeks the small flat was put to rest in a damp shady spot. Nine months later the flat was bursting with little *Amsonia* desperately in need of larger quarters. Apparently all those seeds wanted was time and some cold weather. By July, 120 young plants flourished in their sunny nursery, awaiting assignment to permanent homes. *Amsonia* seeds have a strange appearance: they look more like miniature twigs than seeds. They're cinnamon colored, about a quarter of an inch long and slightly over 1/16 of an inch in diameter, cylindrical in shape and borne end-to-end in an elongated seed pod.

Amsonia ciliata seeds planted in fall also germinate well the following spring.

penstemon

Penstemon digitalis turned out to be a bit of a family joke — the only seed we sowed to produce three plants per seed. Of course we were being facetious, but when the seed (sown in fall) germinated in early spring, little green leaves covered the flat, fighting desperately for a survival spot. Unfortunately, crowding of seedlings is sometimes wasteful; the necessary separation of the small *Penstemons* resulted in some loss. However, enough remained for us to set out several hundred in sunny beds. Seed holds well in the seed pod and can be collected in August. Plant immediately.

Penstemon smallii and *Penstemon laevigatus* are treated in the same way.

butterfly flower

Butterfly flower *(Asclepias tuberosa)* is guaranteed to brighten your garden with animated colors. Gather the seed in August, refrigerate, and plant the following April. Germination should occur about two weeks later, and plants will bloom the first year. Because of the "parachute" seed-dispersal mechanism of *Asclepias,* collecting can become a messy business. To avoid being covered with milkweed down, select an unopened pod that has colored somewhat and carefully open along the "seam." Seeds should be brown. Gently milk them onto your hand, being careful not to include the white fluff.

When the plants bloom, butterflies will flock to the blossoms, and if you are lucky, yellow-, black-, and white-banded caterpillars will hungrily munch on your butterfly flower plants. *Do not spray.* These larvae of the monarch butterfly constitute a fringe benefit to gardeners who grow *Asclepias.* The sight of a monarch, newly emerged from his pale-green chrysalis and pumping his wings in preparation for first flight is beautiful



Butterfly flower *(Asclepias tuberosa)*



Bleeding heart *(Dicentra eximia)*

and awe-inspiring. Young plants stripped of leaves will almost always recover completely. If you cannot endure seeing your plants decimated, gently move the offender to another representative of the milkweed family.

The pink-flowered swamp milkweed *(Asclepias incarnata)* may be grown in the same way. Butterfly flower prefers a hot, dry site with poor soil; swamp milkweed wants a moist situation.

lobelia

Red lobilia *(Lobelia cardinalis)* and two blue ones *(Lobelia siphilitica* and *Lobelia puberula)* can be treated the same as *Asclepia*. Lobelia seed is very tiny but easy to gather. The plant blooms in August, and the seed pods remain well into fall. Germination is excellent on *cardinalis* and *siphilitica* and fair on *puberula*. All three of these thrive in moist, fertile garden soil.

May all your seeds germinate, may you never need to seek a remedy for "damping off," and may only gentle rain fall at convenient times on your garden.

Sources for Seeds:

Far North Gardens
15621 Auburndale Ave.
Livonia, Michigan 48154

The Brandywine River Museum
(seeds available year-round)
Book Store
Route 1, Baltimore Pike
Chadds Ford, PA 19317

DAMPING OFF

"Damping off" is a fungal disease that spells slow death to tender young seedlings and frustration to gardeners trying to control it. When an apparently healthy young plant starts looking weak at the base of the stem — as though the part next to the soil were pinched — and is unable to hold itself erect, it has "damping off." Once the disease is noticed, it's too late to do anything about it. Prevention is the best course to take; use only sterile containers and purchased soil mix. Moisten the mix only until well dampened. Soggy soil takes too long to dry and encourages disease. Try to keep planted containers well ventilated, but out of strong wind or direct sun. Sand or vermiculite sometimes are recommended as top dressing after seeding because they dry rapidly.

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Dot Plyler is in charge of the seed sale for the Brandywine Conservancy at the Brandywine Museum. She has taken courses at the Barnes and Tyler Arboretums, Longwood Gardens and the Henry Foundation. At present she is studying ecology at West Chester State College.



Red lobelia *(Lobelia cardinalis)*

Sweet Woodruff: It Makes the Heart Merry

by Jan Riemer

Among the 250,000 identified plants on earth is a distinct group of mostly tropical and ornamentals from the Madder (Rubiaceae) Family. They include coffee, dyes, quinine, medicines, greenhouse subjects such as gardenias, and a hardy perennial favorite known as sweet woodruff.

In the United States, sweet woodruff is referred to as master-of-the-woods. The English call it woodrose and sweet grass, while the French have given it a musical pronunciation of *hépatique étoilée(s)* or *muge-de-boys,** translated to mean woodmusk. The Germans have chosen the names of *waldmeister* and *herzfreude,* but to be horticulturally correct, sweet woodruff is known as *Galium odoratum (Asperula odorata).***

The first known references to sweet woodruff appeared in Saxon leech books in the year 1000 A.D. referring to its use as smelling salts for headaches. Another ancient notation claimed that the Teuton warriors believed that a sprig of woodruff was needed to wage a triumphant battle. More recently, but still centuries ago, and before we had the advantages of air-conditioning to keep our homes dry from summer mold, garlands of woodruff were gathered in the heat of the season and hung to freshen the air. It was traditional to hang bunches in the churches on the feast of St. Peter and St. Barnabas.

Basically, this woodland plant, which is so well adapted to shady situations amongst trees, also grows well in borders, rock gardens, semi-shaded areas or in places where most herbs would perish from want of sunlight. When strewn along paths, it has the unique ability to release a sweet fragrance reminiscent of new mown hay.



If you are willing to wait a year for germination, your freshly collected seeds can be sown during late summer in a moist, acid soil that has been supplemented with leaf mold. But perhaps the most preferred procedures are to propagate by root division, by division when it first appears in spring, or cuttings from the mother plant in the late spring after it has flowered. The cuttings will take root in three weeks or less if placed in wet sand. Once established, it spreads rapidly from stolons, which are creeping, above-ground roots.

The seeds are thickly covered with hairy bristles that attach themselves to the fur and feathers of animals and birds who deposit them anywhere along the way throughout Europe, Northern Asia, and in Eastern North America where they prefer zones 4 to 8.

In late April through the early summer months, the low growing perennial that stands stiffly erect reaches its pinnacle of 6 in. to 8 in. with neat whorls of shiny, dark green, oblong leaves while sheets of tiny, white star-shaped flowers are formed in loose clusters. The elements contained in the plants are tannin, citric acid and catechin acid, plus a chemical substance known to pharmacists as coumarin glycoside, which emits a dis-



tinctive vanilla fragrance when it completes its flowering cycle, or when the plant begins to fade. The leaves can be harvested before, during and after flowering, although their potency diminishes after flowering. Dry in a cool, dark place so they retain not only their intense fragrance but their color. Once they become crispy dry, strip the leaves from the stem and store in an airtight container until you want to splurge by serving a tea that surpasses the choicest blends from China. However, its myriad of uses far exceed a delicious cup of tea. The leaves are frequently added to potpourris, perfumes, insect repellents, and if you're a pipe smoker you may find that the leaves have been added to exotic blends.

Some of the more discriminating prefer sweet woodruff sachets for their linens instead of lavender, while others might stuff pillows with the dried leaves and flowers to induce sleep. And if you should visit the Netherlands you may have the luxurious experience of sleeping on a mattress stuffed with sweet woodruff.

Those of you who recognize the unique vanilla flavoring of sweet woodruff have probably also detected its use as an addition to liqueurs, beer, ale, mead and some wines. Its most famed use, however, is in the German May wine called Maitrinkle, otherwise referred to as the German Mai Bowle, which consists of a white wine flavored with sweet woodruff and garnished with a choice of early strawberries, lemon or orange slices and spring flowers (see recipes).

The leaves and flowers are also used in tea form for medicinal purposes. It reportedly has a stimulating and uplifting effect on the metabolisim; yet, parodoxically, it induces sleep.

Fresh leaves crushed and laid on bruises and minor abrasions have long been said to be healing and soothing.

Some claim that two to four grams of woodruff in hot water aids indigestion, kidney and bladder problems, dropsy, liver congestion and gall bladder complaints, but, the herbalists also warn that large quantities can produce dizziness or symptoms of poisoning. A prudent individual would, of course, be extremely cautious in any self-medication.

The plants can be potted in late summer and taken indoors if they're supplied with their natural growing conditions of an acid, moist and well-drained soil, cool conditions and at least five hours of filtered sun, but I prefer to leave the plants in their natural habitat, remembering instead, the profoundly traditional message associated with sweet woodruff that says, "Be cheerful and rejoice in life."

**The Book of Herb Lore,* Lady Rosalind Northcote, Bodly Head, London, 1912 (also available in Dover Edition, NY, 1971)

***Herb Identifier and Handbook,* Ingrid Gabriel, Sterling Publishing Co., NY, 1975.

Recipes

GERMAN MAI BOWLE

1 quart of white wine
¼ cup fresh, sweet woodruff cleaned and crushed
¼ cup super-fine granulated sugar
½ cup cognac
1 cup of sliced fresh strawberries
1 bottle of champagne

Place woodruff in a bowl with sugar, cognac and ½ bottle of white wine. Cover tightly and marinate 12 hours. Strain the mixture into a punch bowl. Add the remaining wine, strawberries and ice. When chilled add the sparkling champagne, and serve.

MAY WINE BOWL

(This recipe is from the kitchen of Pat Bonner, a member of the Pennsylvania Horticultural Society)

1 small bunch of sweet woodruff
3 bottles (⅘ qt. each) of Rhine wine or Riesling
1 tsp. crushed cloves
2 tsp. of simple syrup (boil 1 cup of sugar and 1 cup of water for 5 minutes)
2 cups of halved strawberries
Ice
Spring flowers to garnish

Place woodruff in a punch bowl. Add one bottle of wine and let stand one hour. Chill remaining wine. Strain out flavoring and add the chilled wine, then the syrup, stirring well. Add strawberries and keep chilled. Just before serving, pour it over ice and strew a teaspoon of violets or other May flowers.

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Jan Riemer claims that if she had to select only one herb to grow it would be sweet woodruff because of its versatility as a culinary, medicinal and decorative plant.

photos by Ronald Juftes



The driveway planted with dwarf juniper on the left



Slopes planted with English ivy



The high lily turf was planted in the center, a spot inaccessible to the mower.



We encouraged the moss to spread.



Slope planted with euonymous

Utilitarian Ground Covers at Chanticleer and Minder House

by Adolph Rosengarten, Jr.

Grasses, which vary from the unwanted fall grass and muhlenbergia (nimble will) to the desired perennial rye and Kentucky blue, are ubiquitous ground covers. According to Donald Wyman *(Wyman's Gardening Encyclopedia,* Macmillan, NY, 1951), "There is no better [one] if it must be walked on continually." He failed, however, to point out that even if walked on only frequently, grass needs to be mown.

My present purpose is to record some of our experience with utilitarian, as opposed to ornamental, ground covers in areas where mowing was difficult, if not impossible. Today routine maintenance of such areas, with the ever-increasing cost of labor and equipment, explains the recent interest in alternatives to grass. Curiously even as late as 1950, L. H. Bailey's *Standard Encyclopedia of Horticulture* (Macmillan, NY, 1927) contains no entry on ground covers.

Experience at Chanticleer began in 1912 when the drive was dug. The work was done with horse drawn carts by crews who were paid $15 to $20 each for six days of labor.

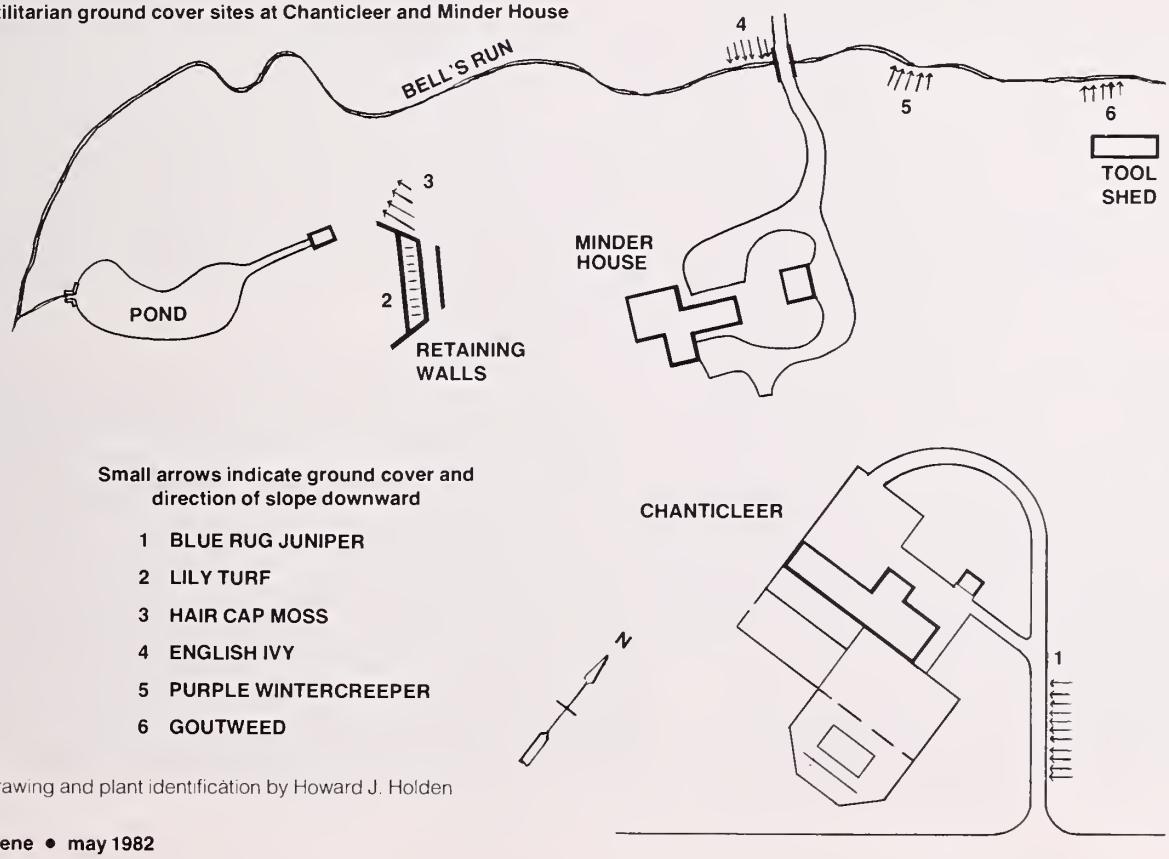
Originally the bank on the left was planted in lawn grass. Its maintenance, however, required two men. One pushed a hand-mower parallel to the drive, while the other walked along the top of the slope and kept the machine on course with the aid of a rope attached to the handle. This procedure ground to a halt during World War II and the bank was planted in common barberry *(Berberis vulgaris).* Though requiring no maintenance, it was hideous, and therefore we replaced it with *Juniperus horizontalis* 'Wiltonii' which, we believe, is both hardy and pleasing.

The problem existing in the next area was of our own making. It occurred because the appearance of staghorn sumac, choke cherry and the like, as well as thistle and vines such as bittersweet and fox grape, on a 15 ft. precipitous bank was odious. So the bank was converted into a three-tiered wall. Unfortunately for us, the middle terrace proved to be inaccessible to any type of lawn mower, so we planted it in creeping lily turf *(Liriope spicata).* Though drab in winter, it is effective in summer.

The third area, which is adjacent to the wall just described, is less abrupt and being curved toward the north gets less direct sunlight. Primarily what we did there was to encourage the existing bed of native moss *(Polytrichum commune)* to thicken and spread by weeding and increasing the acidity of the soil. Also when opportune we extend it with transplants from other spots. To date neither the liriope nor the moss appear to have suffered from drought or zero

continued

Utilitarian ground cover sites at Chanticleer and Minder House



Small arrows indicate ground cover and direction of slope downward

1 BLUE RUG JUNIPER
2 LILY TURF
3 HAIR CAP MOSS
4 ENGLISH IVY
5 PURPLE WINTERCREEPER
6 GOUTWEED

drawing and plant identification by Howard J. Holden



photos by Ronald DiPietro

Christmas ferns are planted on this slope.



Goutweed covers the slope

temperatures.* In both cases, general maintenance is minimal.

Maintaining grass on the steep banks of streams, designated as runs on the old maps, is not easy. And Bell's Run here is no exception. Therefore on such areas we used English ivy. On similar slopes further back from the "run" or stream, we planted beds of purple winter creeper *(Euonymus fortunei* 'Colorata'), Japanese pachysandra *(Pachysandra terminalis)* and Christmas ferns *(Polystichum acrostichoides)*.

A deciduous ground cover is *Aegopodium podagraria*. It is commonly known as goutweed. Daniel J. Farley says, "It is among the worst of weeds and a 'cussed' nuisance. . . Goutweed grows anywhere it can take root in sun or shade." *(Ground Covers for Easier Gardening,* Dover, NY, 1961.) That has not been a drawback here for goutweed appeared of its own accord on a bank that could be mown only with extreme difficulty, if at all.

An objective reason for replacing grass with a utilitarian ground cover is obvious but bears repeating. It is that the risk of injury resulting from a mower, but especially a power mower, turning over (even a "near-miss" can be frightening) is lessened. Subjectively it also reduces the time and trouble that good general maintenance requires. For example, once English ivy has formed the desired carpet, at a minimum, semiannual edging is still necessary. In respect to the others some tedious weeding will always be needed, but it is less exhausting on a hot and humid day than wielding a sickle in a crouching position.

*In February 1934 the thermometer here defied the average temperature in our zone 7 by dropping one night to -16°F, thus killing much of the English ivy.

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Adolph G. Rosengarten, Jr. moved into Chanticleer in Wayne on its completion in August 1913 with his parents. Continuing their interest in horticulture, he has devoted much time and effort to its embellishment in both the English and French landscape traditions. Chanticleer was the scene of one of the Society's symposia in 1976.

Ornamental Ground Covers in a Formal Garden at Chanticleer

by Howard J. Holden

Ground covers are most commonly used to fill in where lawn maintenance is not practical. However, this category of plants is often overlooked when the aesthetics of a property are being considered. That is unfortunate since ground covers can transform a mere backyard into a garden, or even embellish an existing garden.

We chose the ground covers for Chanticleer's formal gardens for their ornamental merit as well as their ability to meet the demands of the site.

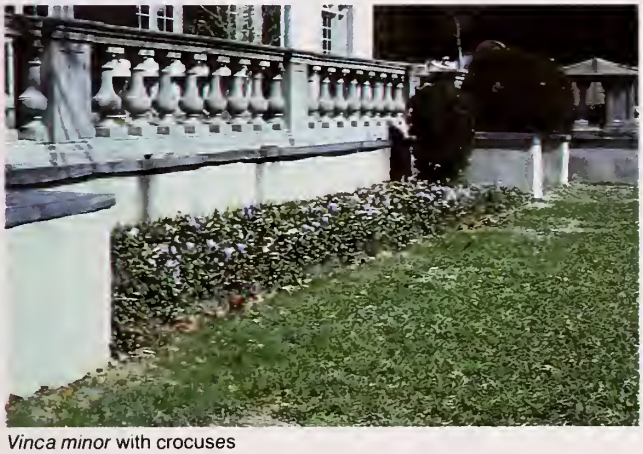
An example of this exercise took place when we removed a bed of azaleas that had outgrown their space and thus hid a beautiful wall. The wall faces north with a large hemlock hedge on its south side. The bed is entirely shaded. Since the bed is a focal point from the house and terrace, the ground cover to be planted had to be of interest year-round. The size of the wall suggested a plant less than a foot high; we chose *Paxistima canbyii.* After three years, the moderately stoloniferous habit of the plants produced an entire bed of *Paxistima.* The evergreen leaves, less than an inch long, add a textural grace to the garden in addition to taking on a bronze hue in autumn. Many a warning has been issued to beware of scale. So far we have had none, perhaps because the nearby hemlock hedge is sprayed annually for scale and wooly aphid.

Directly opposite the *Paxistima* is a bed of common *Vinca minor.* The low evergreen mass is particularly attractive when it stages the bloom of blue and white crocuses that have been planted in the bed. This announcement of spring is closely followed by the vinca's own one inch, light blue flowers.

In another part of the garden, climbing roses had been trained against a wall with a southern exposure, but because the sun was strong they were unsightly by mid-summer. The roses were replaced with espaliered fruit trees. Since the constant cultivation required by roses was no longer necessary, it was decided to neaten the appearance of the bed with a ground cover. The plant had to be low, so as not to interfere with the

continued

photos by Howard Holden



Vinca minor with crocuses



Arctostaphylos uva-ursi



Paxistima canbyi



Berberis gladwynensis 'William Penn'

branching structure of the espaliers, and it had to be an evergreen capable of withstanding full sun. We choose *Arctostaphylos uva-ursi,* commonly called bearberry. Its tiny pinkish flowers produce small scarlet berries, and the young leaves and stems turn red in winter. Considerable sand added to the bed at planting time is partly responsible for its success.

A bed on top of a three-foot retaining wall receiving full sun is the arid home of *Juniperus horizontalis* 'Wiltonii,' blue rug juniper. The silver-blue foliage provides year-round color and grows flat along the ground.

Picea abies 'Nidiformis,' bird's nest spruce, is a dwarf, slow growing version of popular Norway spruce. It has occupied a sloping, sunny bed for almost 10 years and is about 18 in. high. This slow, dense growth makes it a fine evergreen ground cover when planted in mass and some height and spread are not objectionable.

The spring of '77 surprised us with the sudden death of large sections of a yew hedge that had been sheared meticulously for decades. Reluctantly, we removed the entire hedge. Once gone the whole garden appeared roomier. The hedge was replaced with *Berberis gladwynensis* 'William Penn,' William Penn barberry.* The spiny evergreen leaves, small thorns, and low habit provide the necessary physical barrier and structurally important garden line of the former three foot hedge without obstructing the view.

Sarcococca hookerana humilis is a one-foot evergreen shrub that in spring produces fragrant white flowers, which evolve into blackish berries in autumn. When planted in mass on one-foot centers, it grows into a most handsome evergreen ground cover. Our planting is on a protected slope receiving absolutely no winter sun. Sarcococca will brown easily if exposed to winter sun or wind, even though it is quite hardy here.

Not all of our trials are successful. Attempts at growing *Hypericum calycinum* (Aaronsbeard St. John's-wort) and *Skimmia japonica* (Japanese skimmia) have failed after three years of showing promise. Perhaps the minus four degree winds of Christmas morning 1980 caused their demise. A planting of *Potentilla tridentata* (wineleaf cinquefoil) has not lived up to expectations, being just a bit too weedy in appearance for a formal setting. And so the search continues.

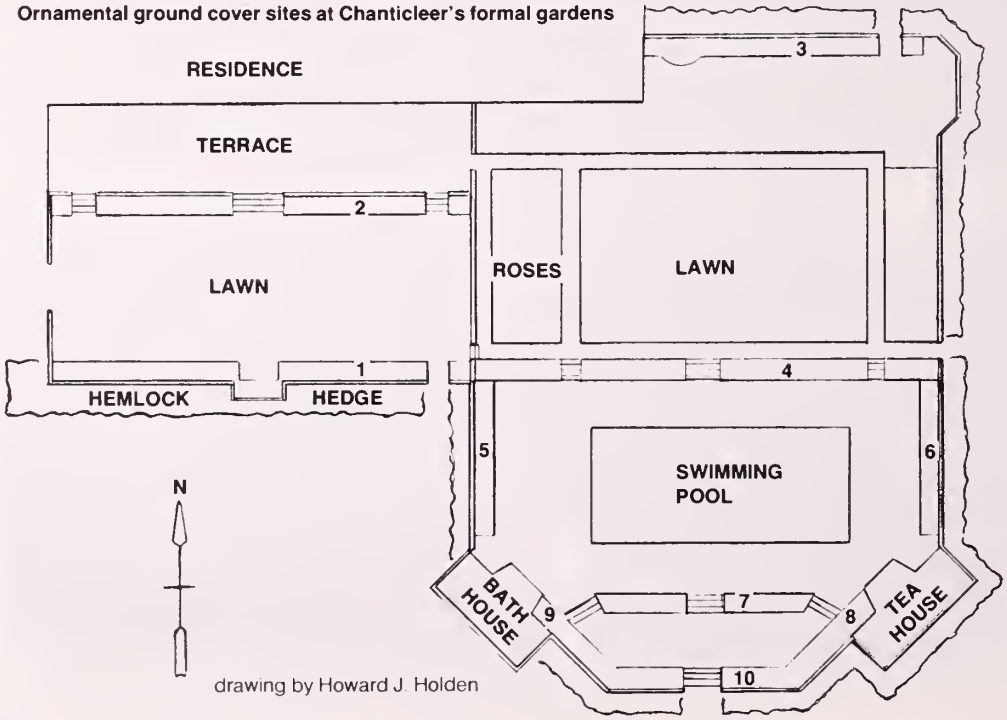
Initially, ornamental ground covers are a high maintenance item, requiring almost as much attention the first year or two as a well maintained lawn. A soil analysis before planting and another every three years thereafter is advisable. Devoted weeding and watering, an occasional fertilizing and mulching, and perhaps a thinning of an overhead canopy of trees or shrubs are required. The reward for these labors will be a permanent and aesthetic foundation to an otherwise bottomless garden.

*The original sport was discovered at the Henry Foundation in Gladwyne; J. Franklin Styer developed, patented and marketed the cultivar.

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Howard Holden is superintendent/horticulturist of Chanticleer, a private estate. He received his degree in ornamental horticulture from Delaware Valley College of Science and Agriculture.

Ornamental ground cover sites at Chanticleer's formal gardens



drawing by Howard J. Holden

1. *Paxistima canbyii*
2. *Vinca minor*
3. *Arctostaphylos uva-ursi*
4. *Juniperus horizontalis* 'Wiltonii'
5. *Hypericum calycinum*
6. *Potentilla tridentata*
7. *Berberis gladwynensis* 'William Penn'
8. *Picea abies* 'Nidiformis'
9. *Sarcococca hookerana* 'Humilis'
10. *Skimmia japonica*

Scale 1 in. = 25 ft.
Chanticleer's Formal Garden

A PAINTER'S GARDEN

by Anne Cooper Dobbins



photos by Sanford Weiss

The painter's kitchen overlooks this garden and path at the back of the house.

It was 1976 – a muddy March landscape outside, but I was thinking *garden*. We had just built a terrace behind our house, and I remember saying to myself, "It's like starting a painting. All that mud outside; it's my empty canvas." And then I realized how much simpler it is to start work on an empty canvas. At least one has a frame. But looking outside, there was no frame at all. Just a great slosh of mud, a ring of cedars around our land – but no beginning, no end that I could see. It was downright depressing.

Now that I've been gardening for five years, I'm more aware of the similarities – and the differences – between painting and gardening.

The major difference is that, sooner or later, a painting gets finished. Or abandoned. But a garden is never finished. And refuses to be abandoned.

If I had to express what I wanted in a few words it would be a controlled wilderness – a view of nature with a minimum of apparent manipulation.

But there are so many glorious similarities. The way a garden falls into foreground, middle ground and background, depending on how you look at it – and from where.

The way a garden encloses space – and opens out into separate rooms, so to speak. (Flemish paintings do this often – the painter creating sudden openings on the canvas, windows onto fields, perspectives to draw the eye.)

And, of course, there's *color*. I find I tend to grow the colors with which I paint: subtle pinks and violets, mauves, creamy yellows. There's little raucous color in my garden, no marching rows of brilliant reds or purples. I prefer to

continued

A PAINTER'S GARDEN

continued



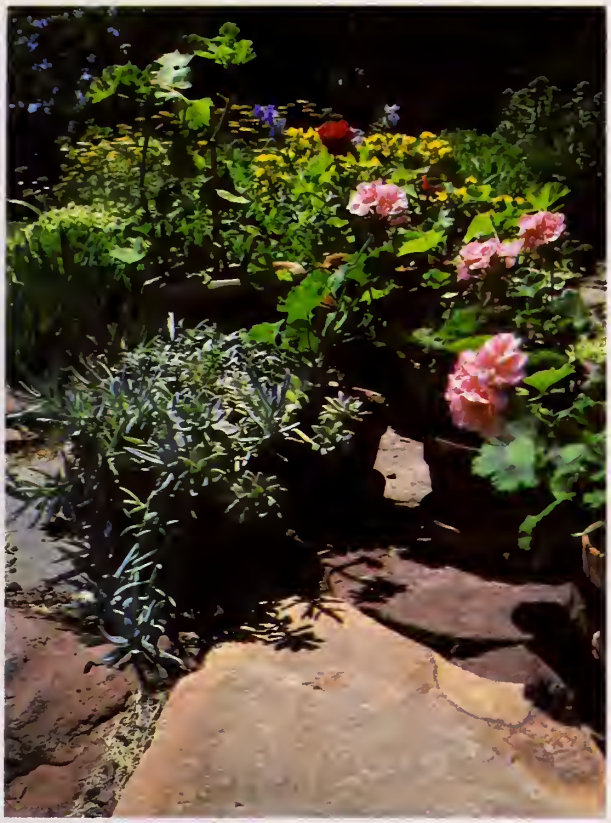
A view of the terrace planting with Andorra junipers, dusty miller, coral bells, pink yarrow and fairy rose. The bed in the background is planted with evening primrose and yellow yarrow.



A stone walk softened with plantings of silvermound and miniature potentilla, and bordered with phlox, yarrow and coral bells.



Rose of Sharon painted by the author



Plants in containers heighten and soften the color ranges along the walk's perimeter.



A painter's garden, a gardener's painting. This oil by the author is of cosmos, Queen Anne's lace and goldenrod.



An example of the controlled wild look of this garden. Sedum, yellow blooming potentilla, sage and a stand of shasta daisies.

continued

A PAINTER'S GARDEN

continued

feather off color, and I'm attracted to the subtlety of close-in-value color schemes. Another curious thing: I find the specific flower colors of my garden creeping into my paintings. It's really quite fascinating how one discipline influences the other.

beginning: the first brush stroke in the garden

But back in 1976 I had no idea of all this. My first concern was where to begin. And how to deal with our own intractable soil (the locals refer to it as one-half clay, one-half shale, and they're not far wrong. When one digs, one spoons up the shaley rock like so much Greek pastry.)

The first beginnings were a planting around the raised terrace behind the house, which turned out to be the first (and by no means the last) serious mistake.

The terrace, you see, was a good two and a half feet high. The beds, painstakingly planned, gloriously planted, were at the base of the terrace. The view from the lawn was spectacular – angel's breath misting into pink yarrow opening to masses of shasta daisies, delicate mauve malva and silvery gray dusty miller. But when one sat *on* the terrace, one had to crane one's neck to see even a speck of color.

First lesson learned: Consider the vantage point. As a painter I should have known. I would have had to grow giant 10-foot sunflowers for them to be visible.

By the time I corrected that mistake (by elevating various beds), it was 1977. But the garden was rolling. And, just as a painting gets rolling, ideas began to jell, one thing leading to another. I revised as I went. As in a painting, the various parts began to mesh, to come together through subtle shifts and refinements. I began to realize that gardening, like painting, involves a sense of play – with color, texture, space – tall and low, smooth and rough, grass and stone and green stalk.

Once the terrace planting began to work out, the garden became insidiously bigger. In fact, there was no stopping the spread of controlled bloom. Stone-walled elevated terrace beds grew inexorably into stone walks interplanted with sedums and thyme.

At that point, a neighbor who was quite a skilled gardener pulled up an enormous bed of perennials and flowering bushes and offered me her treasures. Who could resist? The result was a rampant expansion of my garden – and a total reevaluation of my gardening ideas. I think it was then and there that I began to get a grip on a vision of the kind of garden I wanted.



Inspiration for the paintings are provided by Anne's flower arrangements. This basket full of blooms includes coral bells, yarrow, daylilies, shasta daisies and spirea.

a controlled wilderness

If I had to express what I wanted in a few words it would be a controlled wilderness – a view of nature with a minimum of apparent manipulation. Control – but with a light, an almost invisible hand. But how difficult, how complex the job.

I discovered that I could live with the loud "show-off" blooms, the blood reds and arterial purples, if they were background rather than foreground, if they danced in broken patches around the edges of the wilderness.

The view from our back window was over a wild field ringed with cedars. A terrace, densely planted, a rough walk . . . then what? I pondered. The back field enclosed with dark cedars provided almost a fish-eye view of wild grasses. Haycock Mountain stood far in the distance. We were now sitting on a terrace surrounded by a tiered garden.

The next step, it seemed to me, was to enclose, or at least to separate the spaces moving out to the wild areas.

We accomplished that by running a long bed from a little grove of Scotch pines, and planting it with daylilies, snow-on-the-mountain, daisies, evening primrose, tansy and yellow yarrow. The bed runs to two long stone steps which further set off the area. The bed and the steps enclose a large half-moon-shaped lawn that echoes the general shape of the distant field. I planned it so the eye "steps down" from the terrace to lawn, to planting, to lawn, to wild field. The lawn's near perimeter was planted irregularly with brilliant magenta phlox, enormous hibiscus and flowering cardinal, weigela and quince. I discovered that I could live with the loud "show-off" blooms, the blood reds and arterial purples, if they were background rather than foreground, if they danced in broken patches around the edges of the wilderness.

The whole idea was to move the garden into the field, to have it fade away gently into the wild grasses. To help create this "fading" effect, I planted into the field another bed from which rise various cultivated grasses and Silberian iris.

It took a good five years to begin to achieve the look I wanted – a free, unfettered look that echoes the distant field. To my mind, I was taking that wild mystery out there and expressing it in more human, manageable terms. And that, I realized, was what I always tried to do in my painting – to give shape to the shapeless, form to the marvelous sprawl.

Sometimes, in its mysterious way, a painting succeeds. Sometimes, and just as mysteriously, there's a glorious moment in the garden when form, texture and color come together perfectly, when all's well with the world.

Those are the moments one lives for – and for which we should be eternally grateful.

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Anne Cooper Dobbins is a painter who has exhibited widely in galleries in New York and Pennsylvania. Her passion for gardening dates back to the time she was five and played in her aunt's boxwood garden in Tennessee, which she describes "as like a house full of secret rooms and corridors."

The photographs are by her husband, Sanford Weiss, a writer and photographer.

Booked to the Orient

Japanese Landscape Books

by Mary Lou Wolfe



photo from A Photographic Diary of the visit of the Garden Club of America, 1935

Garden Club of America women in a private garden during their visit to Japan in 1935.

"Its situation in the private section of a household renders it an ultra-private, almost secret garden. It is secret in the sense that the garden knows everything about the history of the household, and, as it listens to the private whisperings of the residents' hearts, it disperses their cares and worries in the wind."

From *The Japanese Courtyard Garden*
by Kanto Shigemori

I have never been to Japan and have wanted to go for as long as I can remember. My access to the extensive collection of books on Japanese gardens at the PHS Library has intensified that wish. For me a trip to Japan would be costly, would use a year's available vacation time and, worst of all, would test a lifetime's fantasies. I am apprehensive about visiting Japan because the Japan of my fantasies has apparently disappeared. Mark Holborn in a 1978 book, *The Ocean in the Sand,* writes, "If you travel south from Tokyo down the Pacific coast of Honshu, along one of the most highly industrialized coast lines in the world, where "red tides" in the sea kill all marine life, you pass through cities where passers-by collapse on the streets from photochemical smog and housewives buy oxygen in department stores." Another visitor, John O. Simonds, writing in *Landscape Architecture Magazine,* says, "On the Inland Sea, the fabled sunsets of soft blue, rose, grey and lavender are seen, not through a gauzy haze of mountain mist, but through the fumes of seaside factories and the smoke of passing ships. The reb orb of the setting sun is reflected on water streaked with oil pumped from bilges and strewn with rotting garbage."

Perhaps I have waited too long. I would like to have visited the prewar Japan that John Simonds describes: "Pollution was almost unknown. The air was clean; the streams ran clear. To drop litter along a walkway would have been unthinkable. Gravel was raked in patterns, streets and pavements swept and watered. In the evening the soft glow of paper screens and lanterns illuminated the landscape...the wafting fragrance of incense and the picturesque compactness all created a milieu of indescribable charm." I was born too late. I should have gone with the Garden Club of America women who toured Japan in grand style in 1935. A picture of stocking foot etiquette comes from Mrs. Arthur Hoyt Scott's copy of her tour album, which she gave to the PHS Library. I'm sure the GCA travelers saw the Japan of my fantasies; the one I have enjoyed through Japanese prints and visits to the Japanese gardens of the Brooklyn Botanic Garden and Philadelphia's Fairmount Park. But Simonds, the realist, continues speaking now of present day Japan: "Only in the privacy of their homes and walled gardens can citizens and their guests take refuge from the cacophony which surrounds them." Taking refuge, creating a small, personal world in one's garden is what most of us are doing today whether in Tokyo or Philadelphia.

Westerners have been visiting Japan for a century, fascinated by concepts of "less is more," borrowed scenery, the integration of house and garden and the impression of naturalness and effortlessness in Japanese garden compositions. We are drawn to the techniques that produce year-round attractiveness, that use space, rocks and illusion so skillfully, emphasizing the architectural

continued

qualities of plants more than their bloom.

What one realizes in reading the literature of Japanese gardens, is that for almost a century, since Josiah Conder's 1893 *Landscape Gardening in Japan,* the gardens of one city, Kyoto, have been the main focus of all of these books. Kyoto is an ancient town 30 miles from the Inland Sea, surrounded by mountains and enjoying a climate comparable to Atlanta in Georgia. I imagine that its U.S. counterpart, if youthful American can be said to have one, is Williamsburg, Virginia. Both are former capitals, have been preserved or reconstructed and present an idealized, if archaic, way of life. Kyoto was spared during World War II and appears to be surviving its industrialization although visited each year by over 30 million tourists. One hopes they are not all interested in Kyoto's gardens.

During a 1982 mid-winter American Rock Garden Society study weekend, the focus was on the plants of Japan. One of the well-traveled speakers, Francis Cabot, compared Westerners' understanding of the philosophies behind Japanese gardens to the story of "The Emperor's New Clothes." No one is willing to admit that he really doesn't "get it." Then Cabot flashed a *New Yorker* cartoon showing an oriental philosopher sitting on a mountain gazing at the moon musing:

The moon is like the gong
The gong is like the moon.
Oh what the hell.

The Ocean in the Sand, whose depressing description I quoted in the first paragraph, does a valiant job of helping Westeners to understand the history and religious philosophies that have created Japan's gardens. The author, Mark Holborn, is a Londoner who lectures and broadcasts on Japan, who "travelled light and slept in the houses of farmers and fishermen, in the open fields and hills." He is definitely one who can see the emperor's new clothes and makes us believe that we will see "the ocean in the sand."

An architectural viewpoint is provided by Mitchell Bring and Josse Wayemburgh in *Japanese Gardens: Design and Meaning,* published in 1981. Bring and Wayemburgh, who studied for four years at Kyoto University's Department of Architecture, present 10 Kyoto gardens built before 1650 in their book. Each garden is carefully documented with plans, sections, conceptual drawings, and photographs so that the reader can visualize both overall design and specific details. Individual photos are noted by position and direction of view on the site plans. If one is among those 30 million touring Kyoto, time schedules must be followed and one can be swept through a garden without really seeing its most important features. This book acquaints the reader with garden highlights and special views, orienting one diagramatically in a most effective way. The ancient Chinese landscape practice of geomancy is described in both Conder's and Holborn's books but was more understandable to me as presented by Bring and Wayemburgh. Although it is hard for this Westerner to comprehend "veins of energy contained within stones" and the need to "harmonize the currents between them," I do understand the logic of placing a house and its garden on south facing sites and orienting dwellings on the inside bend of a river to avoid the erosion that occurs on



Photos above and to the right are examples of two courtyard gardens in Kyoto. Kanto Sigemori's *The Japanese Courtyard Garden.*



Color photos reprinted with permission from *The Japanese Courtyard Garden. Landscapes for Small Spaces* by Kanto Shigemori, Weatherhill, New York, 1981.

an outside bank. We read that the practice of geomancy contributed to the invention of the magnetic compass and that many consider it the earliest study of ecology. For the serious gardener or the landscape designer, the final chapters on the principles of design and construction details are concise and illuminating. A table of selected plant materials lists botanical, Japanese and English (common) names along with height, habitat and location in the 10 gardens covered.

Americans who read or watched the television version of James Clavell's *Shogun** experience the tea garden in a way that no gardening book can match. Will we ever forget this description of Buntaro's preparations for Mariko's visit?

"He latched the gate. First he put the taper to the oil lamps. Then, carefully, he sprinkled water on the flagstones and the trees that were now splashed here and there with flickering light, until the tiny garden was a fairyland of dewdrops dancing in the warmth of the summer's breeze...He heard her footsteps on the flagstones, the sound of her dipping her hands ritually in the cistern of fresh river water and drying them. Three soft steps up to the veranda. Two more to the curtained doorway. Even she had to bend to come through the tiny door that was made deliberately small to humble everyone...First she studied her husband's flower arrangement. He had chosen the blossom of a single white wild rose and put a single pearl of water on the green leaf, and set it on red stones. Autumn is coming, he was suggesting with the flower, talking through the flower, do not weep for the time of fall, the time of dying when the earth begins to sleep; enjoy the time of begin-

continued

*From J. Clavell, *Shogun, A Novel of Japan.*
© 1979 by James Clavell.



photo from A Photographic Diary of the visit of the Garden Club of America, 1935

Garden Club of America delegates in the middle of a busy garden touring day in Japan.

ning again and experience the glorious cool of the autumn air on this summer evening...soon the tear will vanish and the rose, only the stones will remain – soon you and I will vanish and only the stones will remain."

No real garden can ever approach for me the one that Clavell created, but some of the gardens pictured in *The Japanese Courtyard Garden* come close. This stunning book by Kanto Shigemori was published in 1981 and contains 93 full color plates splendidly reproduced. The book, subtitled "Landscapes for Small Spaces" is not one for small budgets: it costs $150. Shigemori presents 75 gardens, again in Kyoto, but instead of the public gardens so often described, takes us into private homes and into modern corporate gardens. Each photograph seems to have been taken at the perfect moment and season to communicate the essence of each space. Speaking of these private courtyard gardens, Shigemori says, "Its situation in the private section of a household renders it an ultra-private, almost secret garden. It is secret in the sense that the garden knows everything about the history of the household, and, as it listens to the private whisperings of the residents' hearts, it disperses their cares and worries in the wind." The second half of the book consists of commentaries and an architectural plan for each dwelling, showing the relation of garden to structure. Plans and commentaries are keyed to the color photos and give the address of each garden, the garden designer's name, date constructed and approximate area. Plants are identified in the plans and a glossary lists their common, Japanese, and botanical names. Brief information is included on blooming times and special characteristics. Shigemori makes concise comments about each garden and includes a few gently critical remarks such as "the design of the garden shown here strays somewhat from the intended style of the traditional courtyard garden. If the plants were to be cut back and rearranged, this space would approach more closely the ideal."

Not long ago a friend who had recently visited Japan invited us to see pictures of her trip. I watched carefully for red tides and housewives clutching oxygen masks and studied her slides for evidence of the 30 million Kyoto tourists. What I saw were those beautiful, misty, moist gardens with their borrowed scenery and oceans in the sand. There was scarcely a human in sight. Either my friend has a very selective eye and gets up very early or the reports of Japan's demise are premature. I can't wait to find out for myself.

"First she studied her husband's flower arrangement. He had chosen the blossom of a single white wild rose and put a single pearl of water on the green leaf, and set it on red stones. Autumn is coming, he was suggesting with the flower, talking through the flower, do not weep for the time of fall, the time of dying when the earth begins to sleep; enjoy the time of beginning again and experience the glorious cool of the autumn air on this summer evening...soon the tear will vanish and the rose, only the stones will remain – soon you and I will vanish and only the stones will remain."

From *Shogun* by James Clavell

Some Books about Japanese Gardening from the PHS Library

The Art of Japanese Gardens, Loraine E. Kuck. John Day Co., NY, 1940

The Garden Art of Japan, Masao Hayakawa. Weatherhill/Heibonsha, NY, 1973

Gardening the Japanese Way, Sima Eliovson and Howard Timmons. Capetown, 1970

"Gardens Visited by the Garden Club of America in Japan." n.p., 1935 (non-circulating)

A Guide to the Gardens of Kyoto, Marc Treib and Ron Herman. Shufunotomo Co., Tokyo, 1981

Imperial Gardens of Japan, Teiji Itoh. Walker/Weatherhill, NY, 1970

The Japanese Courtyard Garden: Landscapes for Small Spaces, Kanto Shigemori. Weatherhill, NY, 1981 (non-circulating)

The Japanese Garden: An Approach to Nature, Teiji Itoh. Yale University Press, New Haven, 1972.

Japanese Gardens, Wendy A. Murphy. Time-Life, Alexandria, VA, 1979

Japanese Gardens, Irmtraud Schaarschmidt-Richter. Morrow, NY, 1979

Japanese Gardens: Design and Meaning, Mitchell Bring and Josse Wayemburgh, McGraw-Hill, NY, 1981

Japanese Gardens for Today, David H. Engel. Charles E. Tuttle, Rutland, VT, 1959

Japanese Temples: Sculpture, Paintings, Gardens, and Architecture, J. Edward Kidder, Jr. Bijutsu Shuppan-Sha, Tokyo, 1964

A Japanese Touch for Your Garden, Kiyoshi Seike, Masanobu Kudo, and David H. Engel. Kodansha International, NY, 1980

Katsura: Tradition and Creation in Japanese Architecture, Walter Gropius and Kenso Tange. Yale University Press, New Haven, 1960

Landscape Gardening in Japan, Josiah Conder. Hakubunsha, Tokyo, 1893 (non-circulating)

Magic of Trees and Stones: Secrets of Japanese Gardening, Katsuo Saito and Sadaji Wada. JPT, NY, 1964

The Ocean in the Sand: Japan, from Landscape to Garden, Mark Holborn. Shambhala, Boulder, 1978

Oriental Gardens in America: A Visitor's Guide, Dorothy Loa McFadden. Douglas West, Los Angeles, 1976

"Photographic Diary of the Visit of the Garden Club of America to Japan at the Invitation of Prince Iyesato Tokugawa." n.p., 1935 (non-circulating)

Shōgun, James Clavell. Atheneum, NY, 1975

The World of the Japanese Garden, Loraine Kuck. Walker/Weatherhill, NY, 1968

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PHS librarian Mary Lou Wolfe believes she will make it to Japan in 1982. In the meantime she is eating sushi, viewing Kurosawa movies and enjoying her Japanese prints.

Growing Ferns from Spores: *ptericulture*

by F. Gordon Foster

Ptericulture is not a word to be found in any dictionary; I've coined or hybridized it from *pteris*, a Greek word meaning a fern, and *horticulture*, the art and science of growing plants.

Ferns are among our oldest vascular plants, their origin believed to have been somewhere in the Devonian period, about 300 million years ago. These unusual foliar plants closely followed the primitive algae, fungi and mosses. Ferns are classified botanically as cryptogams, a name alluding to their somewhat mysterious method of reproduction.

Flowers have a simple method of reproducing directly from their seeds. Conversely, ferns reproduce from their spores in a most complex manner, a process that has continued for millions of years. It was not until the middle of the 19th century that Hofmeister described the obscure life cycle of the ferns, thus solving a superstitious mystery emerging from the Dark Ages (see illustration).

collecting spores

Ptericulture is a time-consuming process, but I believe it is well worth the time. Best of all, it does not require an expensive greenhouse; a transparent plastic container and a kitchen windowsill will make an excellent starter.

Although spores are available from seed houses and spore banks of various fern societies, I prefer to collect my own, especially when traveling in far-away countries. This gives access to new and unusual species, violates no plant immigration laws and is conservation at its best.

Spores are very small and vary in shape, size, color and topography, characteristics that differ with each genus. As to size, two or three spores can be placed side by side across a human hair. Color may be green, cream, yellow, brown or black. Some spores have relatively smooth surfaces; others are deeply crinkled and some, like the fragile fern, have projections similar to miniature horns.

To collect the spores, first study the underside of the leaves. Normally, a healthy fern will have two types of leaves, fertile and sterile. In some ferns both types of leaves are similar; other ferns may have dimorphic leaves (two different kinds on the same plant) where the fertile and sterile leaves are vastly different. If the leaf is fertile, the sori *(sorus*, singular, meaning a heap or mound) will be easily seen with the unaided eye or, better, with a 10x magnifier. Each sorus will be composed of several sporangia, little ball-shaped capsules containing the spores. When immature, the sori are generally very light green or white. When they mature, the color darkens to brown or black and some of the sporangia will be found opening. This is the ideal time for spore collecting.



photos by F. Gordon Foster

Fern fossil. During the Mississippian and Pennsylvania periods the growth of ferns was at its zenith. Many of these interesting fossils can be found in the eastern Pennsylvanian coal fields.

On a sheet of smooth surfaced, hard white paper lay a fertile leaf, spore-side down; cover with a pad of newspapers or blotters. If the leaf is of a thick, succulent nature, it is best to change the newspapers more frequently to accelerate dehydration. Depending on the degree of maturity, the spores will be discharged in a few hours or in several days.

The spores are now ready for either immediate sowing or storing for later use. When the spores are fully dried, I put surplus material in vials and store them in the refrigerator at 40°F. Small, give-away samples are placed in gelatin capsules. To simplify the work and avoid spilling, a homemade plastic loading block and a micro-spatula are great assets.

Preparing a growing medium and sowing are the next steps. Here you will not find two fern growers using the same technique. At present I am using three different methods. Spores naturally volunteer on the damp peatmoss bases in my overgrown Wardian cases to form a wall-to-wall carpet of brilliant green. Some volunteer on the plastic walls, only later to die of starvation.

sowing

For a beginner, I would suggest a soilless mixture, either bought or made by mixing equal parts of peatmoss, sand and humus. It is best to sterilize the mix by baking for two hours at 300°F. Before using, it should be thoroughly dampened with sterile water.

Sowing the spores is tricky, with either too many or too few falling in one area. Try putting your spores onto a filing card and gently tapping them to the edge so they will fall evenly into the container. Of course, avoid air currents that might disperse the spores.

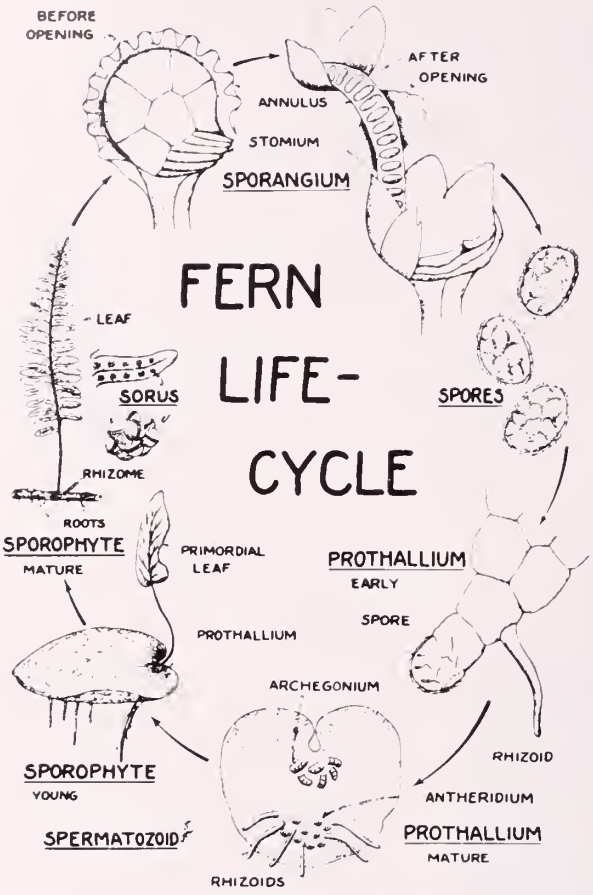
For illumination, use either natural light or artificial light. If natural light is used, avoid the direct rays of the sun. Most of my spores are grown under fluorescent lights. Experience shows little or no difference between the horticultural tubes or the common household lamps. The lamps should be placed about 15 in. above the spores and burned 14 hours daily. Being away on trips for as long as three to five weeks has caused me little concern with the lights on a timer and the containers sealed.

germination

Spore germination sometimes takes as little as five days, but par is just about as many weeks. Spores of some species, like those of the staghorn fern, take nine months or more to germinate. Regardless of the wait, it is interesting to see the first cell of life, not that of a young fern, but the beginning of an intermediate plant, the prothallium.

By the time the second or third cell forms, little hair-like rootlets, or rhizoids,

continued



The fern life-cycle diagram is something like a road map, indicating various stopping points of interest and returning to the point of origin. This continuing alternating cycle from sporophyte (fern plant) to gametophyte (prothallium) and return has occurred throughout millions of years.



Spore growing, reduced to its simplest form, can be done in small plastic containers placed on a light but sunless windowsill.



Fern spores vary in size and all are unusually small. Here is a photomicrograph of a spore shown with a human hair for comparison.

appear. These rhizoids, soon to be followed by many more, reach out for moisture, nutrients and attachment. Both this little plant and the fern that follows are independent and capable of making their own food and are not parasitic in any way. Growth is rapid at this stage and before long the maturing prothallium, a green heart-shaped organism about five millimeters across, is readily seen.

Sex organs are borne on the underside of the prothallium and are so small that they can be seen only with a microscope. The archegonia, or female organs, are small tube-like arrangements of cells located near the notch. The male counterpart, known as the antheridia, are also tubular and located near the base of the prothallium. Each archegonium contains an egg cell at its base, while each antheridium contains many motile sperm cells. At maturity of the prothallium, providing there is a drop of water bridging the two sexual components, the sperm cells, spermatozoids, are released and swim to the archegonia. Eventually one spermatozoid will reach and penetrate an archegonium and conception will follow very shortly. The swimming sperm cells can only be seen with a microscope; observing this prelude to the life of a fern is just one of the many fascinating phases of ptericulture. This newly fertilized cell (zygote) splits into four parts, with each part predestined to be either the foot, the shoot, the primordial leaf, or the root. In about five to ten days the little root and the primordial leaf emerge, and the baby fern is now on the way to take its place in the garden or living room.

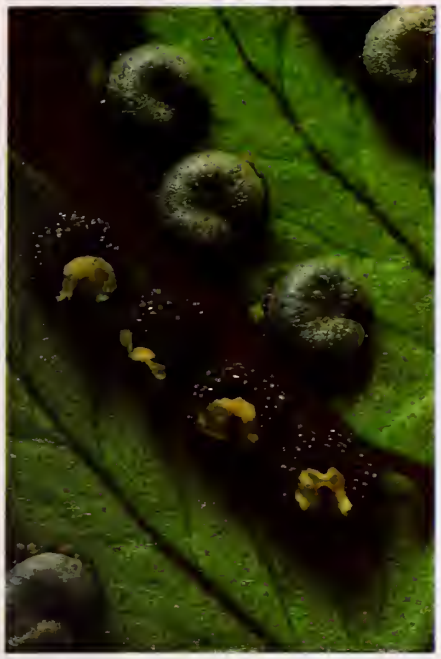
In all probability the spores will have been sown too closely and the tiny ferns will need separating before long. I like to transplant the ferns to small plastic trays, putting the plants in rows about one inch apart. Don't worry if the plants cannot be separated into individuals but, if necessary, plant in clusters of three or four and later remove all but the most advanced plant. Of course, the humidity should be rather high, an old fish tank covered with glass or plastic makes a good temporary greenhouse.

When the ferns outgrow this intermediate transplanting, they can be further planted into individual 3-in. pots or terrariums, dish gardens or planters. At this stage I have found that, with care, hardy exotic species can be planted outdoors. Remember, the leaves are tender and should be protected from strong light for two or three weeks until hardening is complete.

Thus growing and observing each step of ptericulture has its own reward. The crowning joy, however, comes 18 to 24 months after sowing the first spores. It is at this time you can point with pride to a planter or rock garden filled with many rare species, either native or exotic, and to the surplus ferns you are willing to share.

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F. Gordon Foster, author of *Ferns to Know and Grow,* Hawthorn, NY, 1976, is an honorary staff member of both the New York and Brooklyn Botanical Gardens and a Fellow of the Botany Department of Drew University. In 1978 he was awarded the Pennsylvania Horticultural Society's Distinguished Achievement Medal.



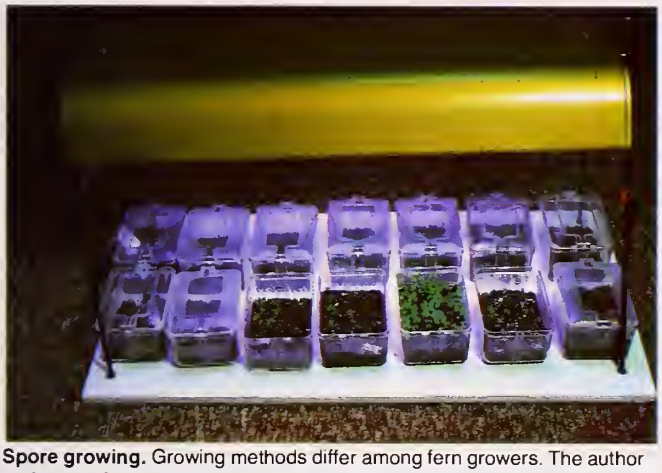
Fertile area. Sporangia, little containers carrying the spores, grow in mounds or clusters and are known as sori; all are arranged in interesting geometric patterns. In some cases the sori are covered with protective coverings known as indusia. This picture shows the fertile area of the marginal shield-fern, *Dryopteris marginalis.*



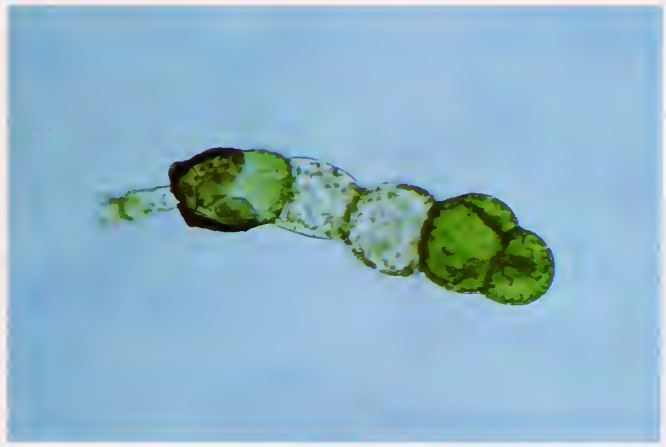
Spore pattern. In collecting spores, the leaf containing mature sporangia is placed spore-side down on a piece of smooth, hard white paper. Before long, the spores will leave a fern-shaped pattern. Shown here is the spore pattern of the Japanese painted-fern, *Athyrium goeringianum.*



Spore sowing. Uniform spore sowing is best done by putting a very small amount of spores on a filing card and gently tapping them onto the growing medium. Hold the card close to the growing surface and avoid all air currents.



Spore growing. Growing methods differ among fern growers. The author prefers the Sylvania two-tube fluorescent lamp stand. Light is controlled by a timer for a 14-hour day.



Germination. The first sign of germination is noticed when the spore opens and a new green cell appears. This is the beginning of an intermediate plant between the spore and the fern and is known as the prothallium. As these initial cells form, rhizoids, or hair-like roots, reach out for moisture, nutrients and attachment.



Mini-greenhouse. Windowsill greenhouse made from transparent bread box. Here the young plants can be grown taller in a higher, controlled humidity.



Hart's-tongue fern, *Phyllitis scolopendrium,* now 30 months old, grown from spores collected in England. They are fully hardy and have survived their first winter in Sussex County, NJ, where the temperature dropped to -10°F.



LETTERS TO THE EDITOR

GYPSY MOTH

We do not agree with James McKeehen's article on the gypsy moth *(Green Scene,* March 1982) and its implication that (1) spraying with chemical insecticides is the best way to approach the gypsy moth problem and that (2) environmental hazards of chemical spraying are minimal. There is no doubt that spot spray treatment of limited areas done under rigidly controlled conditions is justified (park areas receiving heavy human use, single specimen trees, evergreen plantations). From an ecological point of view there is equally no doubt that if any spray is to be used, BT would win hands down over Sevin and Dylox. But most studies made of the problem have demonstrated conclusively that chemical insecticide spraying against gypsy moth on any but the most limited areas is questionable for these reasons:

1. It doesn't do any long-term good.
2. It causes the problem to get worse instead of better.
3. It creates environmental impacts worse than that of the gypsy moth itself.
4. The gypsy moth problem itself is relatively minor – especially in the Delaware Valley.

Let's consider two of the major findings to come out of present gypsy moth research.

1. Spraying is counterproductive, having no effect on long-term gypsy moth population densities (studies done in Connecticut and Massachusetts).
2. Spraying kills many beneficial insects, including the most important parasites of the gypsy moth – actually encouraging gypsy moth populations to increase to pest status **more often** than if spraying had **not been done** in the first place. Two of these important parasites (sarcophagid and tachinid flies) can be 90% reduced by chemical spraying. The Pennsylvania State Bureau of Forestry says in reference to forest spraying, "Experience has shown that large scale spraying more or less guarantees a resurgence of the gypsy moth because parasites could not become adequately established." (Bureau of Forestry, *Fact Sheet on Dylox,* May, 1980.)

Furthermore, it is highly debatable whether or not the gypsy moth constitutes much of a problem at all. Consider the following:

1. "There is little evidence to indicate that long-range adverse environmental effects from the gypsy moth occur to any significant degree. . . . In most of the Delaware Valley, the problem is not as serious as people think. That part of the state doesn't lend itself to aerial spraying. We've undertaken this program [aerial spraying] in response to public demand" (James Nichols, Chief, Pennsylvania Division of Forest Pest Management).
2. Most target trees – especially those on deep, well-drained soils – survive 2-3 years' defoliation, a survival mechanism that gets the tree past the period of time necessary for a pest population to build and collapse. It should be stressed that average tree mortality in practically any population varies between 2-6% and that mortality from gypsy moths in hardwood forests including oak is under 10% (Dr. Robert Campbell, Chairman of the National Gypsy Moth Advisory Council). The point simply is that some trees are always dying and that the average gypsy moth impact adds at most 7-10% to the total.

Note particularly that the Pennsylvania Bureau of Forestry **does not spray** its forest lands (90% of Pennsylvania's forests) because it makes the problem worse and is ineffective (they admit this freely).

In any case, the environmental impacts of chemical spraying are far more severe than that of the gypsy moth itself and create dangers to insects, birds – even fish – in direct and indirect ways. Consider:

Birds. Bird populations and spring brood rearing can be drastically affected by insect die-off due to spraying since birds depend so heavily on abundant spring insect populations for feeding themselves and their young. Migratory species such as warblers (as well as resident species) can be affected: Furthermore think of the effect on a fragile fledgling bird on a diet of pesticide soaked insects – even if the parent could find them.

Fish and aquatic insects. Although Sevin and Dylox have been shown to have little direct toxicity to fish, they can be devastating to the standing crop of stream insects on which fish feed. Less food for fish, less fish in our streams.

Soil organisms. Studies have conclusively shown that Sevin and Dylox are lethal to the small soil organisms so important in breaking down organic material and recycling nutrients which form the food chain base for forest animals and birds.

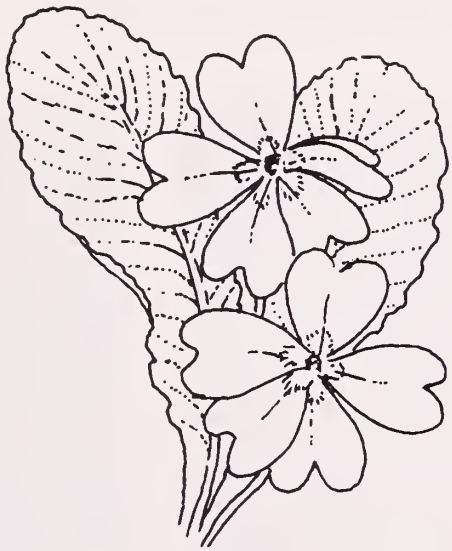


Humans. Numerous studies contradict E.P.A. as to possible birth defects and carcinogenic effects of Sevin and Dylox. The 1969 Department of Health Pesticide Report is one such study reporting Sevin as potentially hazardous to human health.

We should not forget the role of the Pennsylvania State Legislature in adding to the hysteria, misinformation and controversy in the gypsy moth debate. In response to questions and outcry from citizens, the legislature appropriated four million dollars to set up a spray program (against the advice of the State Bureau of Forestry and pest management divisions) and not one red cent to educate the public as to all the issues and problems involved. Caught in the middle, the Forest Service is forced to argue for the program and administer it. Those individuals that don't qualify for the state program rush out to private sprayers, many of whom use Sevin (more dangerous than Dylox) and/or who operate with far less regard for health and safety than does the state. The agri-chemical industry jumps on the bandwagon. Many newspapers get into the act; the gypsy moth is pictured as a plague of biblical proportions threatening to destroy all we hold dear. And so, a bit more chemical pollution seeps into our soil and water, into insects, birds and animals, and most probably into our own bodies.

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Landscape Architect
West Chester, Pa.

W. Gary Smith
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RARE PRIMROSE

I consider the March-April 1982 edition of *Green Scene* generally superb. Imagine my surprise when reading the following statement in the article "A Rare Primrose" by Harold Bruce: "Foster's *Rock Gardening* (Houghton Mifflin, Boston, 1968) contains the only mention of it in the literature I have yet seen." Doretta Klaber, in her book *Primroses and Spring* (M. Barrows & Co., Inc., NY, 1966) gives two and a half pages to describing *Primula abchasica*.

In the first paragraph, Bruce said: "It is fairly new in American horticulture, still so rare and relatively unknown that it is unlisted in standard garden works, including *Hortus III*." Both Doretta Klaber and Lincoln Foster have written garden books that are known throughout the Western world.

While it is true that this primula is unavailable commercially, and while even many sophisticated gardeners are not familiar with the plant, it is not considered rare among members of the American Rock Garden Society, American Primrose Society, Alpine Garden Society, Scottish Rock Garden Club and Alpine Garden Club of British Columbia. The plant does appear on the sale tables of these plant societies from time to time.

Lee M. Raden
Phoenixville, Pa.

The author replies:

I wrote about *Primula abchasica* to acquaint gardeners with a fascinating and unusual plant, which in spite of having been in cultivation in the gardens of specialists for more than a decade and a half, is still little known, not grown commercially, and not even listed in the seed exchange of the American Primrose Society.

I do regret not mentioning Doretta Klaber's book, but in my opinion her book is not a standard reference for the average gardener in the sense that *Hortus III,* the *New York Botanical Garden Encyclopedia of Horticulture,* or the *Royal Horticultural Society Dictionary of Gardening* are considered standard references. None of these list the plant.

The large number of letters and phone calls I've received since the article appeared indicates that not only the average gardener but the specialist is interested in finding the plant. In this morning's mail, for example, a woman who describes herself as "a gardener with a particular interest in primulas," wants to come to Winterthur to buy *P. abchasica*. "And," she adds, "I don't know whether any of our members of the Doretta Klaber Chapter of the American Primrose Society grow your plant."

I would welcome hearing about *any* additional sources for this primrose since our small supply of available plants in the Winterthur plant shop will quickly be exhausted.

Hal Bruce
Curator of Plants
Winterthur Museum

The Watnong Story:
small is beautiful

by Helen Tower Brunet

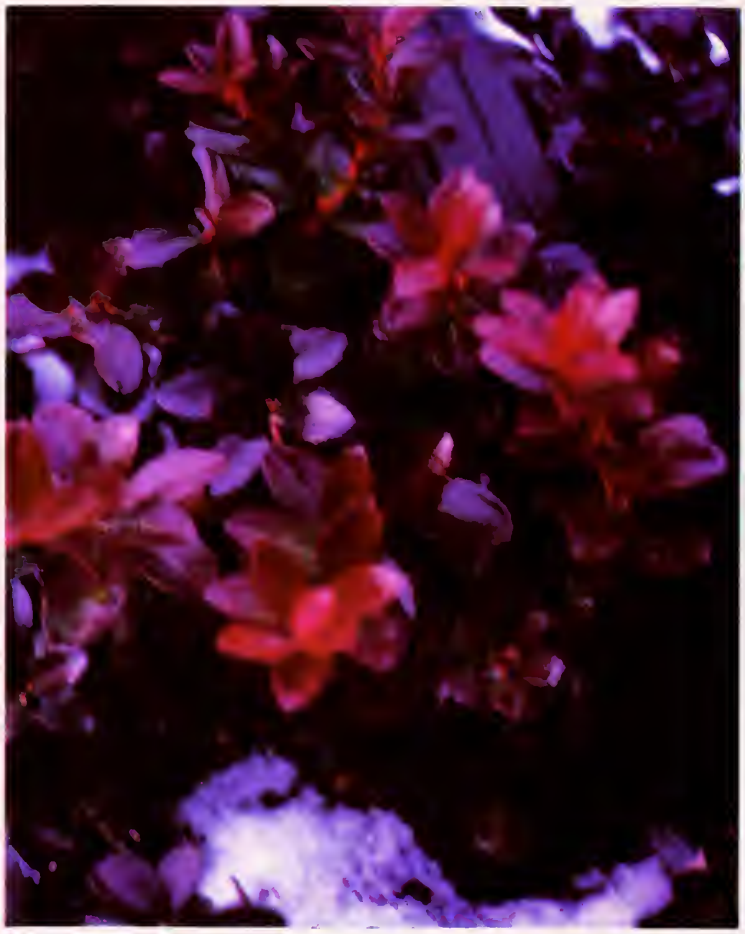


photo by Don Smith

Gaylussacia brachycera in flower in Smith garden.



photo by E. Farney

Gaylussacia bracycera in winter color.



photo by Al Fordham

Elliottia racemosa, April 1981.

In 1954 Hazel and Don Smith looked ahead seven years to his retirement as a teacher and former superintendent of schools in Parsippany-Troy Hills, New Jersey. They wondered what they were going to do with their free time.

Gardening for them had been a pleasure that had to be squeezed into a few weekend hours. Soon they would be able to expand their interest, but they needed a focus for their time and energy. On a little over an acre of land they couldn't grow everything they wanted to; they would have to specialize.

The answer came unexpectedly during a visit to a fellow teacher. "We hadn't visited the house in years, and when we found the address, we still couldn't find the house. The foundation planting had grown up and covered the windows, almost blocking the front door," Don recalled. Obviously their young friend had selected the wrong shrubs for the wrong spot.

This all too common problem with home landscaping gave the Smiths the focus they needed – finding and growing plants with predictable growth patterns suitable for the small homesite.

From that time until Don's retirement in 1961, the Smiths studied every source they could find on dwarf, miniature, and slow-growing plants that could be used in home landscaping. Their constant companions in the early days were the two excellent works *Dwarf and Slow Growing Conifers* by Murray Hornibrook (Charles Scribner's Sons, NY, 1940) and Alfred Rehder's *Manual*

of *Cultivated Trees and Shrubs* (Macmillan Co., NY, 1927 and 1940). Later they used *Conifers* by P. den Ouden and B. H. Boom (Martinus Nijhoff, Netherlands, 1965) and made full use of the library at the New York Botanical Garden.

The Smiths soon found that unusual dwarf evergreens did exist in arboretums and private gardens, but they were very hard if not impossible to find in the trade. The very rarity of such plants and their slow-growing quality made them unacceptable for most wholesalers.

The only solution was to establish a nursery of their own, the Smiths decided. Cuttings of rare plants had been offered by most of the arboretums they had contacted. These small plants and cuttings as well as plants from friends and fellow collectors became the basis of the Watnong Nursery plant stock.

a small slow-growing nursery

Watnong Nursery was officially opened in 1961 with 40 selections presented on a wheelbarrow under a tree. The Smiths' land had been cleared of woods, a small greenhouse was built for propagation and a cold frame constructed.

Don experimented endlessly with ways to propagate difficult cultivars by rooting and grafting. A Nearing Frame* was added especially for rooting dwarf hemlocks; in the cool moist environment of the frame Don successfully rooted 90% of his attempts with the stubborn dwarf hemlocks and *Epigaea repens* (trailing arbutus).

It didn't take long for word of Watnong Nursery to spread, but the nursery itself grew slowly. The Smiths took out one small ad in the *Bulletin of the Americn Rock Garden Society* in the early years and their business began to hum.

Their aim was to educate the public to the possibilities of dwarf conifers and rock garden plants. To this end they traveled on the East Coast in the 1960s and early '70s, giving talks to garden clubs and civic groups (125 lectures in 12 years). They always took along 50 or so live specimens of rare plant material so that the audience could see for themselves.

When Hazel and Don weren't on the road or tending the nursery, they were engaged in plant research and exploration. They did much to popularize our native sand myrtle, *Leiophyllum buxifolium*, which had been neglected as a garden plant. But the Smiths are best known for their work with box huckleberry, *Gaylussacia brachycera*.

This started them on their search to locate colonies [of *Gaylussacia brachycera*] growing in the wild. Through diligent research and endless travel, they were eventually able to visit 27 different colonies of the rare plant.

This evergreen ground cover, which is exclusively found on the East Coast of the United States, was first discovered by Andre Macau in the 1790s. Thereafter it had a checkered career of survival aggravated by the fact that it is self-sterile within its colony and therefore especially vulnerable to extinction. To make matters worse, it was considered difficult if not impossible to propagate.

The Smiths first saw *Gaylussacia brachycera* at the Arnold Arboretum where they were given a specimen. This started them on their search to locate colonies growing in the wild. Through diligent research and endless travel, they were eventually able to visit 27 different colonies of the rare plant. The largest single plant is located near New Bloomfield, Pennsylvania, and other colonies are found in Tennessee, Maryland, Delaware, Kentucky, West Virginia and Virginia.

During this period the Smiths kept the gardening public informed of their progress through lectures and articles in horticultural publications. Don was successful in propagating *Gaylussacia brachycera* at Watnong, and distributed the young plants to three wholesale growers around the country.

pilgrimage of love

Visitors to Watnong Nursery are plant lovers who come from all over this country and sometimes from Europe in search of rare plants. What they find is much rarer – the Smiths themselves. They are a handsome couple in their eighties who radiate enthusiasm and interest, often served up over plates of homemade bread and hot tea. (After a busy day at Watnong, empty tea mugs may be spotted in the rock garden or perched on the edge of the cold frame.) The visitor strolls through a microcosm of rare evergreens planted in the rock garden and display beds. "We want the visitor to see the size and shape of a mature specimen in which they are interested·" Don said, "They can't judge a plant's potential from the young nursery stock that's for sale."

The Smiths are adamant on one point: they are not landscape gardeners or architects. "We can tell you what the plant needs to grow well, but not where to put it," Hazel said.

Yet as many home gardeners have found out the hard way, knowledge of a plant's growth patterns is essential to good plant selection. To assist those looking, the Smiths have arranged the smallest plants, those that will do well in the rock garden in a wall garden, i.e., a rock garden built waist high supported by a stone wall. That placement brings miniature plants closer to eye level and is perfect for gardening without bending over.

If the terrain offers no slope where a stone wall would be natural as a retaining wall, a wall garden may be created using extra fill. Whenever possible, the Smiths recommend that the wall be planted as it is being built, to give the small plants a firm footing, and the wall should be pitched toward the center so the earth stays in place and doesn't get washed away. (See wall garden diagram and box for some planting suggestions, page 28.)

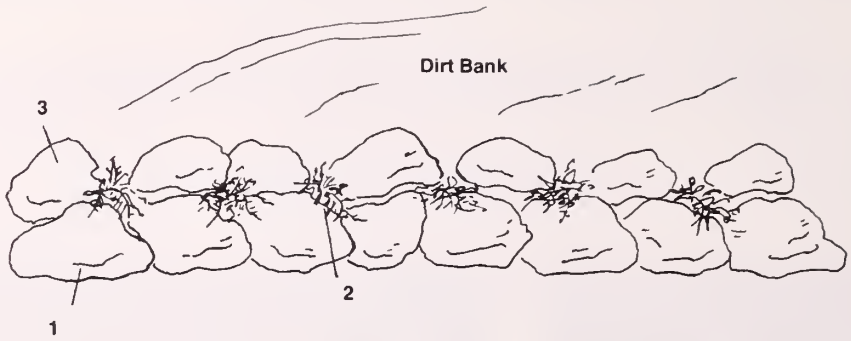
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*The Nearing Frame is a form of cold frame invented and patented by Guy Nearing 60 or so years ago. Nearing's plans called for a north-facing, glass topped pit which had a three-sided shed enclosure built over it and painted white on the inside, made according to precise measurements. The patent has long since run out, and now gardeners construct a nearly Nearing Frame according to their own specifications, but the principle remains the same: that the glass top receive only indirect light, which makes opening the frame for ventilation unnecessary. Don Smith made his frame 18 in. below the soil line, used 5 in. of packed peat moss for the bottom layer and 5 in. of a peat-perlite mix for the next layer when rooting the cuttings.

The Watnong Story:

continued

Planting a Stone Wall As It Is Built



1. First row of rocks ready to be planted in crevices *before* second layer is added.
2. Plants inserted.
3. Second layer of rocks ready to be planted.

planting exchange comes full circle

In the 20 years since the founding of Watnong Nursery, the plant exchange has come full circle. The Smiths have been able to return plants (material) to many of the same arboretums that helped them to get started. When the Morris Arboretum expanded their ericaceous garden, it was at the Smiths' suggestion that grower Jim Cross donated a large collection of heaths and heathers, while the Smiths themselves gave specimens of *Gaylussacia brachycera* and other ericaceous plants. The Watnong gift to the National Arboretum (Washington, DC) was 60, one-of-a-kind, dwarf pines ("only one was lost in the moving") now called the Watnong Collection of Dwarf and Slow Growing Pines. To the Planting Fields Arboretum on Long Island they gave a collection of Hinoki cypresses. The Smiths' numerous gifts to the Frelinghuysen Arboretum include a collection of 30 forms of *Chamaecyparis obtusa*. The Royal Horticultural Society at Wisley has received from the Smiths cuttings of dwarf evergreens, as well as *Gaylussacia brachycera* and *Leiophyllum buxifolium*.

The walls of the Smiths' cozy house are dotted with awards attesting to their love of gardening and the admiration fellow gardeners feel for them. They have received the Pennsylvania Horticultural Society's Certificate of Merit, the Large Gold Medal of the Massachusetts Horticultural Society, the Marcel Le Piniec Award of the American Rock Garden Society and the Garden Club of America Florens Devevoise Medal.

Their retirement project, Watnong Nursery, continues to be a pleasure for them. It is open by appointment only, April through October. "It's the people we've met who have made it fun, and we've gotten special pleasure helping gardening friends to find unusual plants," said Don.

Other sources of pleasure for the Smiths are the marvelous surprises they encounter in the growing business: for example, discovering, finally, how to propagate a difficult cultivar; watching in disbelief a female holly, so confused by a traumatic transplanting that it produced only male flowers and is still a star male propagator; or watching in silent admiration while the *Elliottia racemosa* tree in their backyard produced so many flowers last spring that they feared the branches would break under the strain.

The Smiths' philosophy is best expressed in a quotation by Ralph Waldo Emerson that is framed on the kitchen wall amidst the citations and awards. It is entitled "Recipe for Success" and it reads:

> "To laugh often and much; to win the respect of intelligent people and the affection of children; to earn the appreciation of honest critics and endure the betrayal of false friends; to appreciate beauty, to find the best in others; to leave the world a bit better, whether by a healthy child, a garden patch or redeemed social condition; to know even one life has breathed easier because you lived. This is to have succeeded."

Examples of Offerings from the Watnong Nursery

To be seen in the Wall Garden
Artemisia schmidtiana 'Silver Mound'
Buxus microphylla 'Compacta'
Chamaecyparis obtusa 'Contorta,' 'Tetragona Intermedia' and 'Gnome'
Iberis pygmaea
Pinus parviflora 'Abcocks Dwarf' (candled)
Rhododendron racemosum, dwarf forms
Saxifraga sarmentosa
Sempervivums, assorted
Viola labradorica, V. koreana

Plants that will grow 2 ft. to 3 ft. high
Daphne x *Burkwoodii* 'Carol Mackie'
Kalmia latifolia 'Myrtifolia'
Pieris japonica 'Pygmaea'
Rhododendron keleticum (rose colored)
Tsuga 'Bacon Cristate'
Tsuga canadensis 'Cole's Prostrate'

Cultivars for behind evergreen grouping
Kalmia latifolia (new color forms)
Rhododendron P.J.M. (purple flowers)
Rhododendron Windbeam (pink flowers)
Thuja occidentalis 'Lycopodioides'

Screening plants
Chamaecyparis nootkatensis 'Pendula'
Chamaecyparis obtusa 'Gracilis,' 'Filicoides'
Ilex 'San Jose'
Picea omorika 'Pendula'

●

Helen Brunet lives in Mendham, NJ. She writes a column on indoor gardening for *Yankee* Magazine, which appears in the winter months, a weekly gardening column for the *Daily Record* (Morristown, NJ) and horticultural features for the *Star Ledger* (Newark, NJ) and contributes to other publications on a free-lance basis.

The Crested Rainbow: *Iris cristata*

by Andrew Durham

I last wrote about that wonderful wild leek, *Allium tricoccum,* whose leaves are by now already on their way to dormancy. Right next to them in my garden, another native plant will be putting on a resplendent show as if realizing more plants compete for our attention in May.

Like the wild leek, the dwarf crested iris, *Iris cristata,* also suffers from relative obscurity. Yet it possesses admirable traits as a garden ornamental. It is one of the rare plants that adapts itself to a variety of habitats, establishes quickly without ever becoming weedy, and rewards us with both beautiful bloom and attractive foliage. As a forest plant, it tolerates and even flowers in heavy shade – quite an eccentric habit for iris, which we are always told to drench in sunlight.

During the month of May, china-blue, golden-yellow crested flowers appear from the old rhizomes. Each rhizome is frugal, producing only one or two blossoms, but they clamber over each other forming dense clumps and as a result the bloom is always surprisingly profuse. This is a plant for the sunny rock garden, where it appreciates underlying rocks to keep its roots moist, or for the shady woodland garden, where a moist soil with rich humus is ideal. But how many of our gardens are ideal? It succeeds quite happily for me on a dry, shady hillside with only average fertility so one should consider growing it. Whether in sun or shade, the versatility of this iris does not extend to extremes of moisture; standing water or poorly drained areas are lethal as are sun-baked, dry situations.

The rhizomes deserve special mention as an understanding of these will make iris culture easy. When the flowers are gone, each rhizome puts forth two to six stolons, which grow horizontally for several inches and then throw up a vertical tuft of leaves. The new rhizome with next year's potential flowers forms below these leaves and you will see short root stubs which, upon contact with the soil, will anchor the plant. This is the best time to transplant the crested iris. To wait until late summer or autumn when the new growths are firmly rooted is to ensure problems. Cut the new growths with their root "buds" off and *lay* them on the soil of the new location. Iris rhizomes are very sensitive to rot so you must be sure not to cover the rhizome with any soil. "Plant them proud," the British would say. Indeed, they will tend to flop over and look flimsy to the gardener used to plunging roots securely into the soil, so I usually place a small stone on top of the attached stolon to keep the tuft of leaves standing upright. Keep them moist as you would any new transplant, and the root stubs will expand into the soil.

"Plant them proud," the British would say.

Rhizomatous iris of all types should never be mulched because it only encourages rot, though I have had some success using "living" mulches such as small bulbs, low-growing sedums and ajugas, and other creeping plants.



photo by Andrew Durham

Iris cristata

the rainbow

Botanical names, if understood, often tell us something interesting about a plant. A. T. Johnson, a British gardener and an early 20th century writer, says in his fascinating book, *Plant Names Simplified,* that iris is a Greek word for rainbow, presumably a reference to the wide range of colors available in the genus. The crested iris comes in fewer colors than more familiar species – I was first given the white variety 'Alba,' also with yellow crests. One suspects that various shades of blue are found in the wild, and research confirms this, but those I've seen in cultivation all seem to be the same pale blue. *Cristata* simply means "crested," the botanical term for the type of beard found in this species.

This plant was identified and named by William Aiton in 1756, and many botanists of that century collected it. The British Museum in London has a specimen from the herbarium of John Bartram, the Philadelphia Quaker and botanist, describing it as "a sweet scented plant, growing 5 in. high, which spreads much and differs from the Carolina dwarf iris" (probably *Iris verna).*

Iris cristata is native throughout most of Bartram's hunting grounds – from Pennsylvania south to Georgia and as far west as Ohio and Arkansas. That, no doubt, will justify its inclusion in the naturalist's garden. There exists a group of gardeners who would impale themselves on the gnomon of a sundial before they'd cultivate an exotic plant, but I must admit that I am not one of them. My garden contains as many nonnatives and hybrid plants as it does native ones, and yet, seeing a North American plant succeed where a foreign plant has failed gives me a smug pleasure. My early education in the natural sciences has been superseded by a love for all plants, but there is an authenticity of a native plant in its natural surroundings that cannot be denied. The only hybrid bearded iris I keep are for purely sentimental reasons. I think of them as a civilized flower and adore the stiff, exciting texture of their foliage, but they are out of place in my woodland clearing and must soon go.

Yet *Iris cristata,* with its unforced beauty and appropriateness, will remain, and my sundial, if I had one, would remain unblemished.

Further Reading:

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Dykes on Iris, (contributions of the late W. R. Dykes) ed. George Dillistone. Grosvenor Printing Works.

My Rock Garden, Reginald Farrer. Frederick Stokes. (7th Impression, Edward Arnold, London, 1970)

Plant Names Simplified, A. T. Johnson and H. A. Smith. The Hamlyn Publishing Group Ltd., 1972. (The 1931 edition is the only edition available in the PHS Library.)

Source for *Iris cristata*

Russell Graham
4030 Eagle Crest Road, N.W.
Salem, Oregon 07304
Phone: 503-362-1135

With this article Andrew C. Durham wanted to acknowledge his special feelings for Dr. and Mrs. John C. Wister of Swarthmore who first provided him with cuttings of *Iris cristata* and encouraged and stimulated his interest in horticulture.

THE GARDEN:
A SERIES OF OUTDOOR ROOMS

by Julie Morris

Each year in mid-January my brother-in-law, J. Patterson, would start gazing out the windows overlooking his latest garden projects and begin plotting changes and additions for the coming spring. My sister Carol didn't need any other harbinger of the coming season. J. would get "that look," and Carol knew that some new plan was being hatched.

Over the years since they bought their house in 1968, J. and Carol built walkways, terraces and a deck. They added

I gave him a Washington hawthorn that had once been part of my small bonsai collection. J. untrained it. The tree grew from 15 in. to 15 ft. in a very few years.

new plantings to compliment each new area of garden construction. I often suggested to J. that he write an article for the *Green Scene* about the design he created for their property. J. turned a very ordinary development lot into something quite special by designing a series of outdoor rooms that provided privacy as well as plenty of living and playing room for his active young famly. As a landscape architect for the state of New Jersey, J. spent most of his time designing highway plantings and parking areas so the work he did on his own property gave him the opportunity for a different kind of creativity.

J. never wrote the article and when he died in 1980, I decided that sometime I would write about the work he did in planning and carrying out a design that created a very livable and charming series of outdoor spaces. J.'s photographs, taken over a twelve-year period, are the real chronicle of the changes I will describe.

The builders advertised that a fully landscaped lot surrounded the new

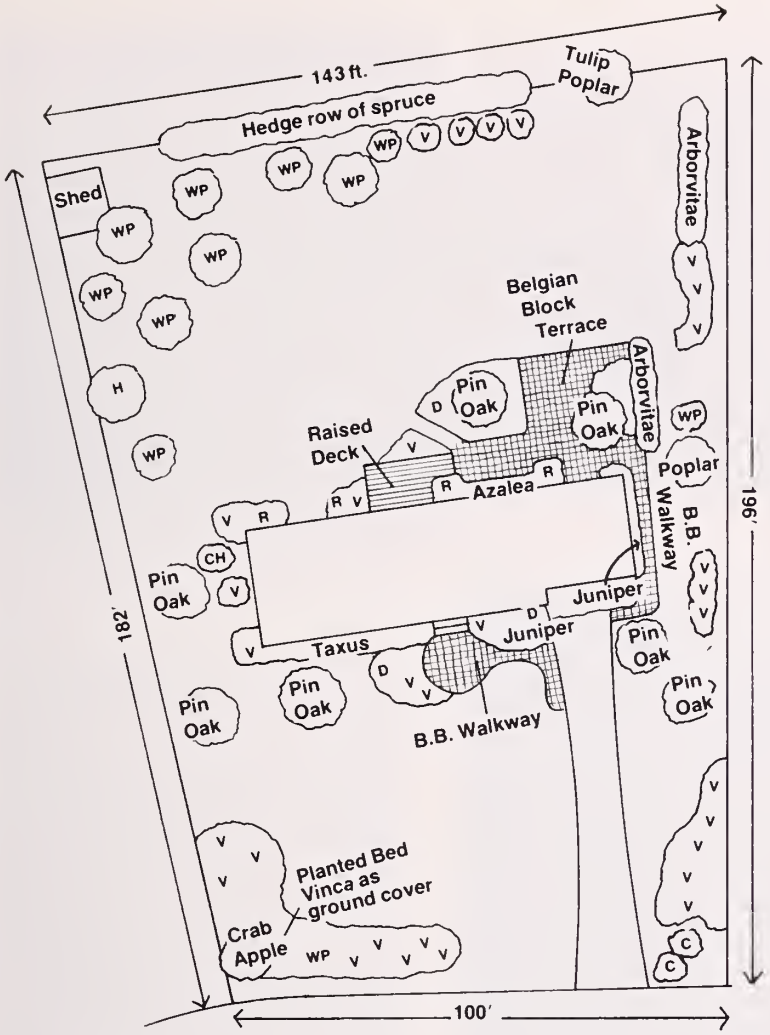


photos by J. Patterson

In March 1968 the landscaping in the front yard consisted of 3 red cedars.



Within five years the trees and shrubs have filled in the landscape. The double file viburnum at the corner of the drive blooms in late spring.



BB—Belgian Block Walkway
D - Dogwood
WP - White pine
V - Viburnum of various kinds
CH - Cherry tree
H - Hawthorne
C - Cedar
R - Rhododendron

All main planted beds are wood chipped; large beds in front have many daffodil bulbs. Juniper areas in front of house are raised. Areas around terrace and pin oaks in rear contain pachysandra, ivy, iris and daffodil bulbs, hosta.

1 in. = approx. 20 ft.

brick and frame house that Carol and J. decided to buy in Pennington, New Jersey. The landscaping consisted of three cedars and a forsythia by the corner of the driveway and two dying peach trees in the backyard.

J. first planned a series of plantings that would delineate property lines without looking like a row of soldiers. He also decided on areas where trees could be used to break up uninteresting expanses of lawn. His window gazing began about that time. J. wanted the plantings to be as pleasing from the inside of the house as they were from the outside.

He planted seven pin oaks strategically around the property. These were later surrounded with shrubs and terrace construction. A row of yews was planted along the front of the house and out from the corner to soften the space and allow room for additional plants. J. then planted 12, 2-ft. black pines across the back of the property in a modified "S" curve. The shape of this planting provided privacy from the neighbors on the north and would hide future work and storage areas.

The property is rectangular in shape about 200 ft. across the front and 150 ft. deep. The house faces south. When they bought the house Carol and J. had neighbors on the east and north sides. Knowing that someday a house would be built on the east side, a screen planting between the two properties was planned.

shuttling the path

The first outdoor construction was a belgian block path from the driveway to the front door. The granite paving blocks weigh about 15 pounds each and vary in size but average 8 in. x 5 in. x 4 in. The path was extended to run part way along the driveway to replace turf that was worn away by constant foot traffic and to add some interest between the drive and lawn.

The belgian blocks that J. used in the front path were but a few hundred of the nearly 4,000 that he bought, collected or scavenged over the following year or so. In all only 400 were actually purchased. J. would follow the dump trucks hauling away the stones from the streets in Trenton where they were being ripped up. He could only carry a few dozen at a time without ruining his car so it became a tedious process until the day of his biggest haul.

Jay convinced a truck driver to dump several truckloads of the stones onto his driveway. The only catch was that he also had to accept the fragments of street that the stones were attached to. To the neighbors' dismay 30 cubic yards of blocks and street were dumped in Carol and J.'s driveway. They had to clean the asphalt and other debris from each block before it could be stacked and used. Carol and J. worked steadily at this project for nearly a week. As the number of blocks grew, about 1,500 in all, Carol and J. used wheelbarrows to remove the detached street fragments to a landfill area that was conveniently close by.

"...Men in every age have felt the need to reconcile themselves with their surroundings and have created gardens to satisfy their ideals and aspirations."

From *Garden Design* by Sylvia Crowe

With this treasure trove of paving materials at hand, J. began the rest of the garden construction he had planned. The belgian blocks vary in color from gray to a grayish brown. They are virtually indestructible, unlike brick, and their rough texture as well as color combine well with the plants. One other reason J. chose them over brick was that the house was mostly brick and he wanted a contrasting material.

the terraces

The two terraces J. built underwent many changes before he was satisfied with the design. Fortunately J. set the blocks in sand, and he could dig them up fairly easily. The surrounding plantings were another matter. Soon the pin oaks and other plants grew too large to be easily shifted. Other than leveling a raised bed, J. didn't change the design drastically after 1973.

continued



Before: The front steps were exposed to the street. Tiny spreading yews peek through the weeds along the front of the house.



After: The curved path and semicircular planting had created a more interesting entrance. Vinca, viburnum and juniper grow along the path.

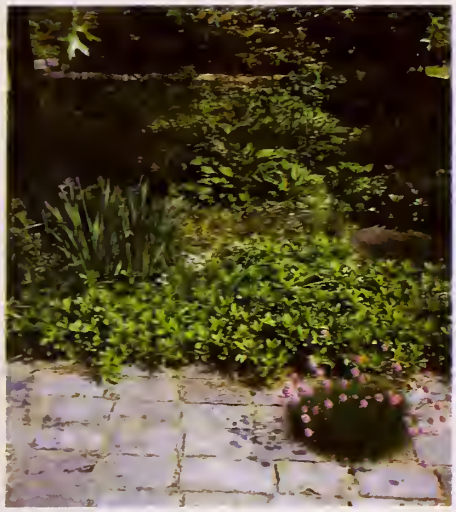


Before: An early layout of the terrace was later changed to create three separate but adjoining spaces.

The terraces are on slightly different levels and their shapes vary. These outdoor rooms are edged with railroad ties. Larger paving stones serve as steps and were placed in paths that were in the planting beds. The walkways between the terraces are wide enough to serve as sitting areas when there is a party on the terraces. Large, round, "found" stones that J. hauled back from beaches and other places mark the corners of the terraces and designate the change in levels. The pin oaks now provide a canopy of shade over much of the area but there is still space to sit in the sun. The



After: Eight years later the pin oaks provide a canopy over the terrace.



A combination of ground covers and hostas were planted for their contrasting foliage textures and colors. The Anenaria provides a bright spot of color between the paving stones.



J. redesigned the shape of the terraces several times. He set the belgian blocks in sand so they could be shifted easily.

paths from the terraces now extend to a deck built off the dining room. It is in full sun and completes the series of outdoor rooms.

Landscape projects were interrupted only briefly in 1970 while J. converted part of the garage into an office and family room. He finished off the rest of the garage a few years later.

pulling it all together

Once the garden and house construction were completed, J. began tying together his earlier plantings. One last bit of belgian block work was finished when J. rounded off the path by the front

continued



A combination of junipers and viburnums screened the terraces from the vegetable garden and work areas.



The pin oaks break up the expanse of lawn between the house and street.

door creating a semi-circular landing with the paving blocks. J. planted *Viburnum carlesii, Vinca minor* and spreading junipers in the surrounding bed. Three volunteer dogwoods were moved when they grew too large for the space. He built a raised bed along the new room next to the garage. J. and Carol used sedums and sempervivums between the stones in the path. Candytuft was spotted along the path.

The pin oaks in the front of the house broke up the 75-ft. space between the house and street. A corner planting along the street of crab apples and viburnum shielded the approach to the house.

J. planted a row of arborvitae to the east of the house. These screened one end of the terrace. A few more plants were placed in a staggered fashion and they now hide the wood pile. Because of their year-round interest, J. included several varieties of viburnums in each of the shrub plantings. Doublefile Tea and Leatherleaf are a few of the varieties he planted.

The use of plants for year-round interest was part of the plan J. conceived as he looked out the windows doing his spring plotting. I gave him a Washington hawthorn that had once been part of my small bonsai collection. J. untrained it. The tree grew from 15 in. to 15 ft. in a very few years. The bright orange fruit gives good color late into the fall and early winter. The oaks hold their leaves for most of the winter and the berries on the viburnum often last through the winter snows. The curved row of black pines has grown into a gracefully shaped screen, lovely throughout the year.

To the neighbors' dismay 30 cubic yards of blocks and street were dumped in Carol and J.'s driveway. They had to clean the asphalt and other debris from each block before it could be stacked and used.

The trees on the terrace were underplanted with vinca, ivy and pachysandra. Spring bulbs, azaleas and rhododendron were planted in the beds around the terraces. Bold-leaved hosta grows in the shadier areas and gives way to beds of hemerocallis in the sun.

The effect of the overall planting is one of pleasing form, color and texture. Something we all strive for in our own gardens. J. and Carol and their two children were often away during the summers or had projects other than gardening in mind. So other than a small vegetable garden, with some flowers for cutting, they did not plant garden beds or flower borders. There was much weeding to do in the early years as the groundcovers took hold and the plants started to fill in here and there.

Several years ago when I was working in the PHS Library we set up a display of landscape books. I remember using several quotes from Sylvia Crowe's fine book, *Garden Design* (Hearthside, New York, 1958). My favorite of the quotes I used explains some of the reasons behind the hard work J. put into his garden. "Gardens are the link between men and the world in which they live, for men in every age have felt the need to reconcile themselves with their surroundings and have created gardens to satisfy their ideals and aspirations."

J. Patterson died in June, 1980 at the age of 35. The garden he left reflects the care and pride he took in all his work. My sister considers the surroundings that J. created for his family a most joyful part of his legacy.

●

Julie Morris, former PHS librarian, left the Delaware Valley to become a garden consultant in Newport, Rhode Island. In addition to her consulting work, she is currently the education coordinator at Blithewold in Bristol, Rhode Island. She was an exhibitor in the horticultural class at the 1982 Flower Show.

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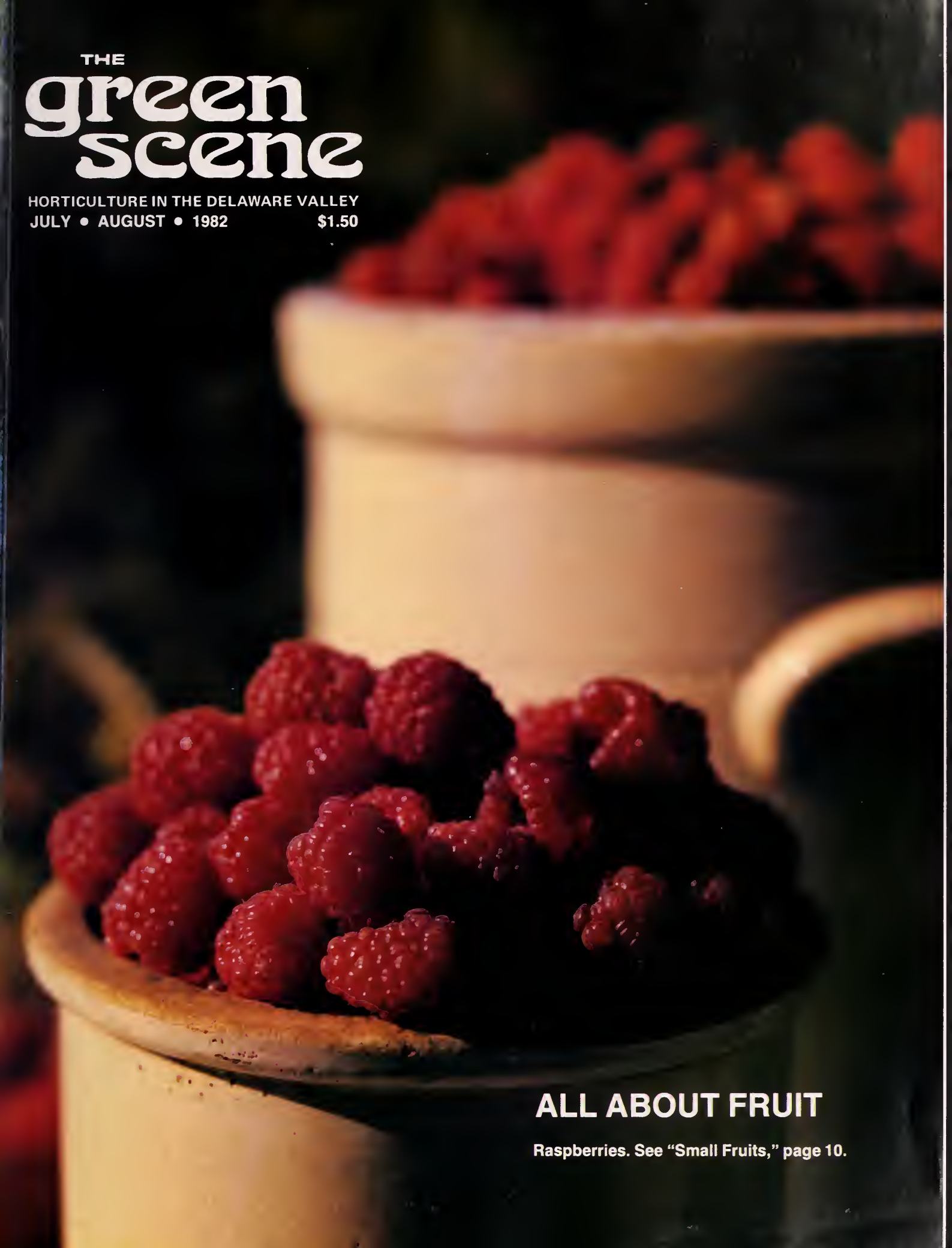
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ALL ABOUT FRUIT

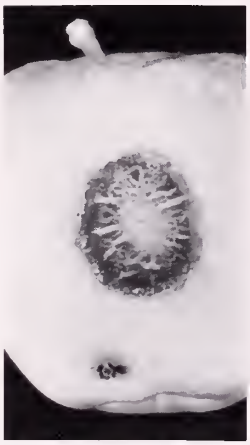
Raspberries. See "Small Fruits," page 10.

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Confessions of a Fruit Lover

by Paul G. Wiegman

When I was in high school I loved fruit: fresh fruit, fruit salad, fruit cocktail, any fruit that was fresh, sweet, and succulent. A September walk in an apple orchard, or a trip to Florida citrus country was ecstasy. Fresh, ripe, and right off the tree, having sun ripened fruit fresh from the branch was heaven on earth.

In those naive days I believed fruits to be apples, peaches, pears, plums, and a few other assorted plump, colorful objects that hung from trees in the late summer. Under the same heading, the southern immigrants such as oranges, grapefruits, lemons, limes, and others, were also easily defined as fruits, but in a special citrus tree category. Occasionally my favorite fruit stand would have some fancy foreign exotics such as fresh papaya, kiwi, ugli (pronounced "ugly"; a cross between grapefuit, orange and tangerine), pineapple, passion, and banana. For the most part I assumed that they also came from trees, except pineapples, of course, and I reasoned that they grew on bristly miniature trees without trunks.

As a rookie botanist and confirmed fruit lover, my classification of fruits was simple and direct. Occasionally an esoteric fruit-vegetable discussion would be philosophically debated between myself and some gardener friends, but ultimately, in my mind, a fruit was a fruit.

Then came the first blemish on the tree ripened object of my affections. Botany 101 opened the curtain on bleak reality. The fruit I had clearly defined by taste, color, and the tree from which it hung, was botanically defined quite differently. The professor defined a fruit as a ripened ovary and its contents. Nothing about hanging from trees, or ripening in September, or having colorful skin. Just a ripened flower ovary and the contents, usually the seeds of the plant.

Suddenly, all sorts of things hanging from plants were defined as fruits: sunflower seeds, corn, beans, eggplants, dandelion seeds, wheat, walnuts, peanuts, and even tomatoes. This definition went so far as to call those absolutely inedible, spiny burrs of burdock fruit.

Suddenly, all sorts of things hanging from plants were defined as fruits: sunflower seeds, corn, beans, eggplants, dandelion seeds, wheat, walnuts, peanuts, and even tomatoes.

true and false fruits

Furthermore, Botany 101 took that ripened ovary and declared that there were true and false fruits. True fruits were defined as being derived from the female flower parts of a single flower. These fruits included maple seeds, peas, squash, apples, acorns, and petunia seeds. False fruits, on the other hand, were also ripened female parts, but the resulting object was fused together from several flowers. Raspberries, strawberries, and pineapples were all examples of false fruits. Now I was further dismayed. The strawberry that I relished as the ruby of the crown jewels of June was false.

Botany 201 the next semester further expanded my understanding of fruit and further changed my sophomoric impressions. Beyond the basic definition, fruits were divided into several distinct subtypes. *Dry fruits* had single seeds contained in a dry capsule. Sunflower seeds, grass seeds, acorns, those little helicopters from maple trees, and most nuts, were all in this group. Dry fruits with two or more seeds, such as the crown shaped capsules of poppies, the pods of iris, beans and peas, and milkweed pods, were examples of the second type.

Fleshy fruits, the kind most typically considered as **fruit,** were divided into true and false (finally, after two years of college we had gotten to my once favorite subject). True fruits were further divided into a number of interestingly named subgroups. A peach was botanically called a drupe; tomatoes and grapes, berries; squash was a pepo; apples and pears were pomes; and citrus fruits were called hesperidiums. My botany professor reminded me that to identify the hesperidiums, look for the fleshy hairs on the inner walls. My love of fruit really began to wane by the end of Botany 201. Tomatoes were berries, raspberries were false, and oranges had hairy insides.

Botany 301 finally eliminated my naive impressions of fruits, as I learned plant evolution, and considered the growing of fruit from the plants' point of

continued

Confessions of a Fruit Lover continued

view. I asked, "What good is fruit to the plant? Why should the plant expend all that energy to grow and ripen a comparatively large fruit structure when the plant doesn't benefit directly, as it does with leaves and roots?"

continuity guaranteed

The answer was that to the individual plant, fruits are useless. But for the species, fruits assure continued survival as they contain the future generations, the seeds. Throughout the living world, the individual is secondary to the continuance of the species. A plant is a fruit's way of producing another fruit.

Unfortunately, fruits of plants, unlike the young of animals, have an inherent problem. They can't easily or willingly move great distances. Therefore, when a plant's children can't leave the nest, the nest gets overcrowded to the detriment of both parents and children.

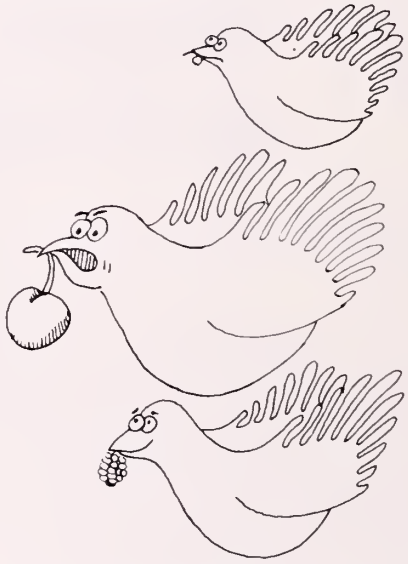
Through long years of evolution, this problem has been solved in a number of ways. Most often the solution is to recruit outside agents to carry fruits and seeds to new places. Orchids have developed extremely small seeds, which are light and carried by wind. Coconuts have large, fibrous, buoyant fruits, which are transported by ocean currents to new islands. Maples evolved winged seeds moved by air currents. Burdocks grow hooked seeds that ride to new places on the fur of passing animals!

Imagine, millions of years of evolutionary testing and experimentation with tasty packaging, and we reward the trees by selecting those without the ability to produce seeds – a gift wrapped box with no present inside.

Another general clearing away method used by a large number of plants is to develop showy, tasty, aromatic fruits to be eaten. The seeds, embedded in the center, are swallowed along with the fleshy pulp. The hard coated seeds are designed to resist digestive acids, and pass unharmed through the animal. Days later, and often miles away from the parent plant, the seed is conveniently deposited in a new location, ready to germinate with its own supply of natural fertilizer. Cherries are a good example of fruits dispersed by this method.

This clever approach has been taken to an extreme, with seeds that *must* be eaten and pass through an animal's digestive system before they germinate. Enzymes in the seeds inhibit germination. The animal's digestive chemicals neutralize the seed's inhibitors. Then when the seeds finally pass through the animal they are ready to grow, e.g., the mulberry and the Galapagos tomato, which must go through the Galapagos turtle.

If the seeds aren't eaten, and fall to



the ground, they never germinate. This stops new plants from developing below the parent plant and competing for light and water. Many fruits eaten by birds are examples of this process.

Production of fleshy, showy fruit is not without its drawbacks. Foremost is the constant temptation of hungry animals to eat the immature fruit before the seeds inside are ripe. If the fruit is eaten at that time the immature seeds will not germinate.

To solve this problem, fruits develop in two stages. In the first stage, the fertilized ovary begins to expand. This is not production of new cells by division, just enlargement of the already present cells. The size increase is staggering, with some fruit expanding several hundred thousand times. The process is started by chemicals created in the seed. As the fruit enlarges, the cells fill with chemicals that render the immature fruit bitter and able to sicken the consumer. A green apple stomachache is testimony to the efficiency of this form of protection.

The second step toward assuring germination is ripening, and it is a strikingly different process. A critical chemical, ethylene gas, is produced in this phase and stimulates the enlarged cells to ripen. In this process the full sized fruit softens, astringent tannins and acids are replaced by sugars, and colorful pigments are deposited in the outer covering. The plant then advertises the attractively packaged seed to prospective customers. The price is reasonable. All the animal has to pay for the succulent treat is to expend the energy to carry the seed away from the parent plant.

love turns to guilt

But here is where my love of fruit has, in reflective times, turned to guilt. Think what we have been doing to the apple trees. They have trusted us with their offspring for years, gladly bearing seed attractively wrapped in a succulent white flesh. But what do we do? We take the riches and throw the potential young into garbage disposals, sewers, and landfills.

Think of the citrus trees. They are further humiliated through artificial reproduction as humans create "seedless" fruits. Imagine, millions of years of evolutionary testing and experimentation with tasty packaging, and we reward the trees by selecting those without the ability to produce seeds – a gift wrapped box with no present inside.

But the years have mellowed my reactionary feelings, like ethylene gas transforming the bitter green apple into a sweet golden delicious. Although we as cultivators have stymied the original method of the plant by not replanting its seeds, we continue to carry out the basic intent of the method. Apples, pears, oranges, and many other fruits are spread throughout the world. As gardeners we continue to grow apples where there were none before. Through plant breeding and selection of varieties that best suit our needs, we produce hybrids adapted to new climates and habitats. We bring greater plant diversity to our environment. And while pondering such basic questions, I'm getting back to my early love of fruit. "Would you pass that juicy freestone drupe please?"

●

Paul G. Wiegman is the director of the Natural Areas Program for the Western Pennsylvania Conservancy. A botanist, writer, and photographer, his work takes him to the natural nooks and crannies of Pennsylvania to see some of the state's most scenic treasures. Although most interested in native wild plants, he admits to taking busman's holidays in his tomato garden and window greenhouse.

FRUIT TREES IN THE HOME GARDEN

by John F. Gyer

As I write, this year's crop of nursery catalogs has arrived with its portraits of fruits at their peak of color, size and flavor. Although intended to evoke eager anticipation of harvests yet to come, for me they bring back memories of the farm where I grew up and the pleasure of munching pears in the old garden on misty mornings that were tangy with the first hint of autumn chill. When I got my home in New Jersey that lingering memory of primal pleasure led me to try raising a variety of fruits. Some experiments were successful and very pleasurable. Others for one reason or another were unmitigated disasters.

apples

I'm an apple conservative. I like the older varieties I grew up with, and I like them as standard trees. Because standard apple trees mature at about 40 feet, I can grow only a couple in the available space. But I like the aged look of the winter outline of pruned branches against a crisp blue sky. About late April the branches burst into a cloud of pink-white bloom that perfumes the yard. In the summer the tree casts a pleasant shade and is high enough to walk under to a branch supported swing. At harvest I still enjoy clambering through the canopy to the farthest branch for that big sun-reddened fruit just beyond reasonable reach.

The yield from a single standard apple tree is ample for Janet and me to eat, and to freeze and to give to family, neighbors and friends. Our favorite McIntosh is now 16 years old and regularly yields several bushels each fall. Its cycle of bud, bloom and fruit set largely determines our insect and fungus control spray schedule up to late June. I like to apply a lime-sulphur spray for fungus control after pruning, but before the buds begin to break. When the buds show pink I begin to spray for insects and for fungus. Effective combination insecticide/fungicide sprays are sold in garden stores under various brand names. For example, the Ortho brand materials come in convenient sizes for home use. (Also see "Controlling Fruit Insects and Diseases," page 25.) There is no spray during bloom when the bees hustle through the flower clusters to replenish their winter depleted larders with honey and pollen, the twin spring crops from our apples. When the petals fall and the bees depart there are at least four weekly fungicide/insecticide sprays. This basic schedule also serves for peaches, nectarines, apricots and plums. Cherries, because they ripen in late June to early July, need fewer sprays, but a fungicide application about three weeks before ripening is needed to minimize brown rot.

Rodents are the only major problem we've had with apples. Back on the New York farm my father decided to try organic orcharding one year and mulched a few newly set apple trees with spoiled hay. That winter some critter, probably a meadow vole, found the hay a haven well stocked with fodder, and for dessert – apple bark. Each tree was girdled by gnawing. We saved a few by bridge grafting: a series of fresh branches were grafted from undamaged tissue at the root to undamaged tissue above the gnawed girdle. Several grafts were placed around the tree, and the wound and grafts were covered with grafting wax. The top was severely pruned to reduce transpiration; we crossed our fingers, and nature went to work.

In New Jersey I thought I'd be free of small rodents so I didn't use the spiral plastic "tree guards" now available in garden stores. These guards wrap around the trunk from about root level to about 24 in. above the ground. They expand as the tree grows and protect it from both winter sun scald and rodent damage. Instead of the guards I kept the area near the new trees weed free during the winter to discourage any stray mice and voles. But New Jersey has rabbits. They are particularly fond of apples and girdled a young Lodi about six inches above the ground. I tried a bridge graft and it worked. The tree struggled through spring and sprinted into summer only to be permanently tilted northward by a September hurricane. Although it wasn't planned that way, the

continued



photos by John F. Gyer

Trimmed apple tree silhoutted against bean poles.



Blossoms give spring beauty before the summer harvest of peaches.

FRUIT TREES IN THE HOME GARDEN continued

Lodi now gracefully leans over a stone lined drainage channel by the garden and yields massive crops every fourth of July.

Ever since Eden apples have been associated with knowledge of good and bad. This seems to stem from the tree itself for it has both good and bad growth habits. The good and fruitful branches grow nearly parallel to the ground while the rank and barren growth shoots vertically to rob the ripening fruit of light just when it is most needed to produce a glow of harvest color. The difference is due to the action of gravity that shifts the balance of growth hormones so that horizontal twigs and branches produce the short plump fruiting spurs that break into spring bloom and summer fruit. The two types of growth make pruning decisions easy. I cut off anything that grows straight up (unless I want to change the structure of the tree) and leave anything that is horizontal and has fruiting spurs.

Some genetically changed trees have been found that lack the genetic knowledge of bad rank growth. These are the spur types. Not all varieties have spur type sports, but those that do are very fruitful. At our house we have a spur type Delicious apple trained against a dog pen fence beside the barn. It bears beautifully colored and shaped fruit that Janet won't use until they fall because they look so pretty on the tree. By comparison, two dwarfed trees next to the Delicious produce very little.

Dwarfed trees are useful for gardens with only a small space, a narrow strip beside a driveway or beside a house wall for example. A spur type tree grafted onto a dwarfing rootstock would grow to an attractive hedge or espalier. This sort of compound tree is beginning to show up frequently in productive commercial orchards where they are planted as close as seven feet within the row and trained to various supports. (See "What Would Johnny Appleseed Think?," page 34.) Since a row of trellis trained trees form a narrow hedge, the ground beneath gets good light and can support another crop. Strawberries and sweet woodruff, for example, would enable you to toast spring blooming with your own sprightly May wine.

Nurseries offer a bewildering assortment of apple varieties. They have a selection of old vintage varieties, a selection of newer introductions, and a collection of spur types in dwarf, semi-dwarf, and standard formats. Because some apples are not self-fruitful the catalogs generally indicate which varieties should be grown together for good pollination. Personally I like the plant quality and variety selection offered by Miller's Nursery in Canandaigua, New York (see source list accompanying this article). Stark Bro's in Louisiana, Missouri, is a leader in the development of spur type trees and offers excellent information on the space requirements of the various dwarf and standard tree formats. More locally, Bountiful Ridge in Princess Anne, Maryland, has an extensive apple selection, but I like it mainly for its peaches and unusual fruits like oriental persimmons.

At harvest I still enjoy clambering through the canopy to the farthest branch for that big sun-reddened fruit just beyond reasonable reach.

peaches

Aesthetically I think peaches top the fruit list. The trees are a mist of pink in the spring; a sphere of glossy summer green; and the arched branches of fruit have the glow of an inner fire seen through frosted glass.

Peaches are easily grown in the Delaware Valley so long as the soil is well drained. They do not like wet feet. Peaches take up little space. Standard trees reach 10 to 12 feet, dwarfs about 8 to 10. Young trees usually bear the year after planting and are in nearly full production by their third year. They are self-pollinating and often are so laden that the fruit should be thinned out to improve individual size and maintain the vigor of the tree. A space of about six inches between young fruits gives good size and yield. Thinning should be done in early July after the natural June drop of immature green embryos that were not adequately pollinated.

I have had no really serious disease problems so long as I follow a good spray schedule. In spring and early summer the peaches are sprayed along with apples and other fruit. From June to about three weeks before harvest the peaches and other stone fruits are sprayed about every two weeks with fungicides that inhibit brown rot and insecticides that discourage borers. However, I do not use miticides on peaches, cherries, apricots or nectarines. Although these materials protect apples and vegetables from this insect, they tend to defoliate the stone fruits.

Brown rot is the bane of peaches, plums, nectarines, and cherries. It can come on swiftly in humid weather and within a few days a tree of glowing fruit can be converted into branches strung with grey-brown fuzz balls. This fungus does not ordinarily attack tree branches, but if rotted fruit is left on the tree the constant concentrated infection can wound or kill twigs and small branches.

Smooth skinned fruits like nectarines, plums and cherries are particularly vulnerable to brown rot. They have a waxy surface that does not hold spray materials as an overall film. Instead spray particles tend to concentrate in patches and may induce the fruit to form surface scabs. This problem can be reduced by adding "spreader/stickers" to the spray mixture.

Peaches with their coat of fuzz are easier to protect than smooth skinned fruits. But peaches like the other stone fruits expand rapidly as they ripen. Skin breaks from insects, hail or other causes will be prime sites for rot to begin. Good protection against early season damage pays big dividends at harvest.

Since new fungicides, insecticides, and weed killers frequently appear on the market, it is a good idea to rely on the recommendations of the agricultural extension service and your county agricultural agent. I've found their advice effective and useful. For example, if I had asked for orchard weed control advice, I probably would have avoided the *accidental* discovery that peaches are sensitive to weed killers. Several years ago I eliminated weeds under a fence with a broad spectrum weed killer. A very vigorous Golden Jubilee grew just down slope from the fence. Within one week the weeds were gone. Within three weeks the uphill side of the peach began to yellow. New growth appeared healthy, but leaf edges and the tissue between the veins turned color and the leaves dropped off. The tree struggled on for about four years before it died. The weeds returned vigorously the next year. Since that time biodegradable weed killers have come to market. Several can be used safely in orchards. The best I have found is Roundup. I use it to

maintain a cleared area around mature trunks. This reduces bark damage from lawn mower scuffing; it discourages mice and voles, and it reduces the survival of peach tree borers.

Peach tree borers are insidious pests that attack most stone fruits. In our garden oriental plums and apricots are their favorites. They find nectarines and peaches acceptable. European plums and cherries are hardly touched. The borer is a rather waspish looking moth that lays its eggs at the base of the tree in late July and August. The larvae burrow into bark near ground level and produce a telltale brown frass and mass of gum. The larvae winter in the tree and emerge in spring to pupate in the soil before flying off as adults to start another generation. (For more about peach borers, see "A Pride of Fruit Trees" on page 14).

To control this pest I spray the trunks and the bare ground around the trees each time I spray the orchard. Local orchardists take pains to mound dirt around the trees each fall and pull it away each spring to disturb the borer's reproductive cycle. Some books suggest mixing moth flakes into the soil around the trunk to kill larvae as they hatch.

apricots

Apricot trees are a little smaller than peach trees, but they are the earliest fruit to bloom. Their large, full petaled, showy pink flowers are a welcome sight in late March to early April. Apricots are also early to fruit. Varieties like Tilton and Goldcot are ripe between early and mid-July. They like the same conditions as peaches, but for me they had two problems that peaches do not have, winter damage and uneven ripening.

Apricots are particularly susceptible to winter damage. They are so eager to begin growth that their sap starts to flow and the cambium cells begin to multiply at the sight of the first robin. When a sudden cold snap comes, the tender new cells are killed by frost. Damage is most pronounced on the south and east sides of the trunk where the sun strikes longest and warmest in the waning days of winter. The result is a severely weakened or dead tree.

Winter damage control is difficult. Orchardists often cover the trunk and branches of susceptible trees with water based white latex paint. This is supposed to reflect heat and reduce trunk temperature. Also, insecticide can be mixed with the latex paint to inhibit borers. Shading the trunk with burlap, evergreen boughs, or planting in protected spots should reduce damage.

The second problem that plagued my apricots was uneven ripening and split fruits. The cheek of the fruit toward the sun is the warmest. This warmth makes the enzymes and hormones work faster. The sun warmed cheek expands; its sugars increase, and it ripens while the shaded cheek is considering whether it really wants to turn from green to gold. Sometimes the differential ripening strains the fruit so much that the skin breaks and the fresh flesh is exposed to damage from rot and mold.

Brown rot is the bane of peaches, plums, nectarines, and cherries. It can come on swiftly in humid weather and within a few days a tree of glowing fruit can be converted into branches strung with grey-brown fuzz balls.

The apricot tree's growth habit does little to shade developing fruit from the direct sun. The trees grow fast and produce sparsely twigged branches. These support beautiful garlands of fruit beneath a glossy green ribbon of leaves. The combination is beautiful, but it does not help keep the developing fruit at an even temperature by shading it from direct sun. A possible remedy would be to plant on a northern exposure or where the tree receives light, high shade.

nectarines

Nectarines are prolific. Their requirements are about the same as peaches, but the trees are slightly larger and the flowers are more showy. Although the smooth, shiny fruit seems difficult to protect against insect damage and brown rot, we still get enough from two trees for table use between late July and early August with a little excess for the freezer.

plums

European plums are generally ovoid, a bluish fruit borne on small compact self-pollinated trees. They are excellent fresh, stewed, or frozen; some dry into delightful prunes. Oriental plums are generally reddish, round fruit borne on small but rather rangy self-sterile trees. The fruit is excellent eaten out of hand, but to our palate some varieties are bitter when cooked. Both types are attractive landscape accents when filled with the white of midspring bloom or the richly colored fruit of late summer.

Both oriental and european plums are attacked by black knot or canker. This infection produces a rough black scab sometimes two or three times the diameter of the branch that supports it. It cuts off sap from the growing tip and the branch beyond the scab dies. A vigorous tree can be reduced to a gnarled skeleton in a few years. A few plum varieties are resistant, but the best control is prevention through a good spray schedule, good garden housekeeping, pruning and burning any scabs as soon as they are seen.

Of the european plum varieties we prefer the Stanley prune, a large fruited freestone plum that ripens with a bloom of misty blue wax over its blue-purple skin. The Damson plum is prolific, but small fruited and for us it does not attain full flavor until nearly October, even though it has looked blue and ripe for over a month. It is a clingstone type that makes excellent preserves. Plums like Green Gage, Yellow Gage and Reine Claude seem sweeter than Stanley, but in New Jersey they are more sensitive to rots.

For us the european varieties have been successful because the trees seem less prone to borer damage and winter injury than the oriental plums. Also the generally freestone fruit of the european types lack the bitterness-producing cells that lie just beneath the skin of some oriental varieties. We discovered this difference when we harvested a yellow oriental plum my father had planted. The fruit was attractive and the soft clingstone flesh was honey-like when eaten off the tree. But stewing released bitterness from the skin. No amount of sugar or citrus juice could bring back the fresh fruit flavor. Although we don't use it for freezing or canning, I suspect that this prolific plum would make a good fruit wine or brandy. Fermenting our own fruit wines is a project I have often contemplated, but one that I have not yet begun. When our trees bear more than we can conveniently use or give away, I eye their excess production as a source of winter ciders. In colonial times fruit ciders were a primary

continued



photos by John F. Gyer

Sweet cherries

orchard product because there was no good way to preserve fresh fruit. Instead, the heat of the autumn sun was used to dry both fruit and vegetables for winter use. Today we have home-sized dehydrators. Janet has found that her dehydrator provides us with good travel or hiking snacks as it preserves some of the excess fruit production from our plums, peaches, apples and apricots. Surprisingly, pears carry their flavor very well into the dried state.



Pawpaw bud

cherries

Cherries come in two flavors, sweet and sour. Sweet cherries form medium to large size self-sterile trees with white bloom followed by the type of cherry that is sold fresh in groceries. Sour cherries are small to medium self-fertile trees with white bloom and brilliant red fruit used mainly in pies and preserves. Both flavors are eaily grown and yield heavily, but both become battlegrounds at harvest.

Birds – robins, jays, blackbirds, mockingbirds and their friends – congregate from miles around to pick and peck the newly colored fruit. Because the trees are small, the sour cherries give us more opportunity to win some reward for our labor, but the victory is never complete. Each year we pull out rolls of black plastic bird netting and wrap the tree from trunk to top in a closed corset. Each year wind and the vigorous advance of our avian adversary find or make new holes for their squadrons to exploit.

From our observation the bird fighting arsenal is as varied as the gardener's ingenuity. Shooting, of course, is out. In suburbs and cities it is not legal, and even if it were it would be ineffective unless the entire local population were destroyed. Such destruction would be a real disaster because throughout the season birds do vastly more good by feeding on our annual plague of insects than they do harm by invading orchards. The best bird fighting is non-violent. Orchardists use loud noises to scare them off. Often gardeners defend their homestead trees by decorating them with reflective pie plates, stuffed owls or owl replicas, snake replicas and other assorted shiny or noisy paraphernalia. I have even heard that there is a spray that makes the fruit unpalatable to birds, but I've not heard what it does to humans.

Of course the simplest ploy is to outfox the birds. When they begin to eat the ripening cherries, take that as a signal that the cherries are ripe. Pick fast and beat the birds at their own game. We have tried that and it does work, but flavor, color and sweetness are greatly improved by letting the cherries ripen for another week or two. For us, however, the extra flavor boost is worth the battle.

We have found that in our New Jersey sands, good fertilization also improves flavor. Each spring mature trees receive about three pounds of 10-10-10 spread under the canopy. I generally include about an ounce of Peter's Soluble Trace Element Mix (STEM) to be sure hidden mineral deficiencies are minimized. In the fall I spread a bag of dolomitic lime under each tree so that calcium and magnesium are available for the flush of spring growth. Just as the cherries begin to turn I dissolve about a pound of calcium nitrate in irrigation water that is sprayed from a lawn sprinkler into the foliage as well as onto the ground. The added shot of calcium seems to make firmer, sweeter fruit.

pears

Pears are my favorite eating-off-the-tree fruit. In a good pear the flesh is mellow with a buttery texture that is sweetly juicy. In general, pears are self-sterile so that two varieties are needed for a good crop.

Pear trees grow more upright than apples and make attractive landscape accents. Some sterile or very small fruited pears are used extensively in commercial landscape plantings. They have attractive winter shapes, beautiful spring bloom, crisp summer green, and brilliant red-to-orange fall foliage.

A spray schedule similar to that for apples keeps the trees in good condition except for one serious problem – fire

blight. This disease is caused by a bacteria that makes the leaves look scorched. A serious attack can defoliate a tree by mid-summer. Resistant, but not immune, cultivars of both apples and pears are beginning to appear in catalogs. However, prevention is best. A fall cleanup of leaves and twigs removes bacteria that could winter over and begin a new infection. Bacterial spores need a film of moisture on the foliage to germinate and grow. Thus, fire blight will be reduced if pears are planted where there is good natural air movement to keep leaves dry. Commerically, streptomycin sprays are used as a control. But for the home gardener, fixed copper fungicides are more available. Bordeaux Mixture and the newer copper hydroxide called Koecide may be helpful. I spray three times, at two week intervals, starting about mid-June.

persimmon

There are a number of plant genera that have Japanese or Chinese species closely related to species that inhabit eastern North America. The persimmon belongs to that group. The Japanese persimmon is a large fruit borne on small trees that are marginally hardy in the Delaware Valley. The selection of hardy clones is a research objective at the University of Maryland. Commercially, Bountiful Ridge Nursery offers a selection of four varieties. (See source list.) We have had poor success with bare rooted plants, but last summer a friend gave us a potted Sheng that was planted out and grew well. It looks as if it has survived the zero weather of last winter. (Also see M. M. Brubaker's article, "The Black Persimmon," page 24.)

American persimmon trees are medium-sized with fruit about 1.5 to 2 in. diameter. The foliage is glossy and attractive; it turns a bronzed magenta in the fall, just as the persimmons begin to soften and fall.

Native persimmons and some Japanese persimmons are astringent until fully ripe. At full ripeness the Japanese persimmons are golden to bronze in color and have a smooth delicious pulp. The native persimmons are ripe when they are fully soft and brown. Ripening of either type can be speeded by enclosing them in a plastic bag with an apple or two. The apple gives off ethylene gas that acts as a ripening hormone.

American persimmons are dioecious; that is, the male and female are on different trees. If there are no persimmons in your area both a male and a female tree should be planted to give a good crop. American persimmons are available from small nurseries that specialize in native fruits and nuts. One that has a good selection is Louis Gerardi Nursery, RR 1, O'Fallon, Illinois 62269.

pawpaw

Both the pawpaw and persimmon are native North American trees. Their natural distribution patterns have provoked an intriguing ecological speculation.

From our observation the bird fighting arsenal is as varied as the gardener's ingenuity. Shooting, of course, is out.

Earlier in geologic time, large herbivorous mammals populated eastern North America. The pulpy fruit of the pawpaw and persimmon were well designed to be an attractive meal for such foragers. The large, thick-skinned seeds easily survived digestion while they were carried to favorable open sites to establish the next generation. The large mammals are gone and the distribution of these trees is now determined by less efficient dispersal processes. In a sense they are living fossils.

The pawpaw is a small to medium sized tree. Its deep maroon blooms burst from the branches just as the leaves are beginning to expand. These are followed by banana shaped fruit about two to four inches long and about one to one and a half inches thick. When ripe the flesh is yellow to cream with a pleasing aroma and taste. Its custard-like consistency gives rise to a common name – the custard apple.*

In Philadelphia a stand of native pawpaws grows at Bartram's Garden along the Schuylkill. This year the garden offers seed from its trees to gardeners who would like to start their own pawpaws. The seed germinates readily if it is planted in the fall and subjected to the freeze/thaw cycles of winter.

what we've learned while growing fruit

As Janet and I progressed through the trial and error learning process of raising our own fruit and adapting it to our landscape, we were often guided by the pragmatic approach that the older generation of Finger Lakes farmers took to their dooryard plantings. If the tree did not produce a fruit, nut, or sap that they could eat, they did not plant it. This produced yards blessed with the cool high shade of sugar maples and vegetable gardens edged with fruits.

When we applied these old teachings to our own property, Janet and I found that fruit trees grew well when they were not planted in an orchard-like arrangement. For example, one of our apple trees is planted near a stand of evergreens that acts as a privacy screen at the property line. Spring offers a brilliant contrast of pink-white apple against the dark evergreens. In summer this combination offers cool shade that is hung with brilliant red ornaments in the fall. Since plums are small trees, we have planted them as an arcade along a grassy path in the vegetable garden. Because cherries are relatively carefree, neat trees, one is incorporated into a foundation planting near our bedroom window. I look forward to late June when I can reach out the window and pick a breakfast snack.

Janet and I have enjoyed learning to incorporate fruit as a productive and interesting part of our landscape. We hope our experiences will induce others to use the flowers and forms as well as the harvest of fruit trees to provide year-round pleasure.

*See also "The Northern Custard Apple," by M. M. Brubaker, *Green Scene*, May, 1976, page 30.

Sources

Bountiful Ridge Nurseries, Inc.
Princess Anne, MD 21853

Louis Gerardi Nursery
RR #1
O'Fallon, IL 62269

J. E. Miller Nurseries, Inc.
Canandaigua, NY 14424

Stark Bro's Nurseries
Louisiana, MO 63353

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John Gyer grew up in the Finger Lakes region of New York where he learned his love for the land and its products. He studied chemical engineering at the University of Rochester, chemistry at Drexel, and biochemistry at Temple. His avocations include botany, photography, gardening and geology. The latter led him to the Wagner Free Institute of Science geology course where he met his wife Janet. They live in Clarksboro, New Jersey, where they are actively developing a wildflower landscape garden and a productive vegetable patch.

Small Fruits

by Jane G. Pepper

Some of our more ambitious garden projects are named after assorted guests, especially family, who have earned their bed and board by toiling in our garden. The raspberry and blueberry patches are, for example, named for David and Andrew who arrived in Philadelphia in their Scottish tweeds one hot spring. Dressed in hastily purchased Sears Roebuck khakis, T-shirts and boots these two brothers helped us strip the sod and lay railroad ties as edging. In subsequent summers we have enjoyed the fruits of their labors and have prepared additional areas to plant these two very satisfactory small fruits.

red raspberries

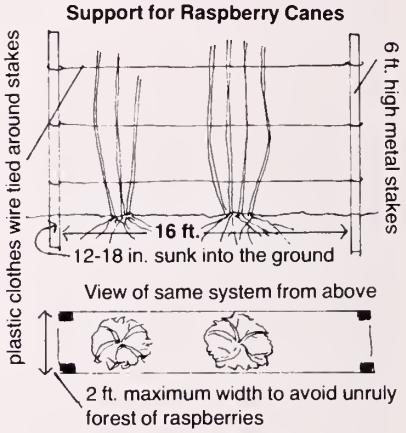
Raspberries are the easiest of fruits to grow, requiring little more than full sunlight, a slightly acid soil, adequate moisture and annual pruning. We now have about 50 linear feet of canes, which provides the two of us and visitors with ample fresh fruit in both summer and fall and excess for freezing from the July crop.

To plant, choose an open spot for the raspberry patch, away from tree roots and shade from nearby buildings. If you want to have more than one row, leave at least 8 ft. between rows. The more sun the canes get the better they will bear. Your soil pH should be 6.0 to 6.5. If you are not sure of the pH, purchase a soil test kit from your local agricultural extension agent and indicate on the form you return with the soil sample that you plan to grow raspberries. In addition to correcting the pH you should incorporate organic matter such as leafmold or compost into the soil to improve its water-holding capacity.

Raspberry canes can be planted in late September or in April. Purchase bare-root canes from a mail order house or potted canes from a local nursery and plant them 3 ft. apart in the row. Water each cane thoroughly if the weather turns dry. The spring following planting you will need to fashion some form of support for the canes. The diagram shown here offers one possibility.

Your selection of raspberry varieties will depend on whether you want fruit in July, in early fall or smaller crops in both seasons. Summer-bearing varieties will bear fruit from around July 4 for two to three weeks, depending on the weather. The so-called everbearing varieties will produce a smaller crop over the same length of time in July. The second crop on the everbearing varieties, which is borne on new canes, will start in early September and last until frost. In both seasons the quality of the crop will depend on the available moisture. A heavy mulch of wood chips or leaves will help, but if the weather is dry as the fruits swell and mature you should, if water is available, soak the raspberry beds once a week.

Support for Raspberry Canes



Since its introduction in 1969, the 'Heritage' raspberry has proved to be an excellent variety, producing a small crop of red fruit in summer and a heavy fall crop. For those who enjoy the very sweet yellow raspberries, 'Fall Gold' is another good everbearing variety. 'Latham,' 'Taylor' and 'Hilton' are three good choices for summer crops. Thanks to work done at the United States Department of Agriculture, fruit specialists now offer raspberry canes that are free of the viruses that have plagued growers in the past. If you are starting a new raspberry bed it is well worth ordering virus-free stock.

Pruning raspberry canes regularly is essential to maintain some semblance of order within the bed. Following planting this fall or next spring, prune each cane to 15 to 18 in. During the following summer new canes, which will produce fruit in the summer of 1984, will develop at the base of the old canes. In August remove the original canes at the soil line.

In future years you should plan to prune in early August, as soon as the summer crop is over. First remove all canes that have borne fruit. These will be tan-colored or brown and easily distinguishable from the new green canes. Next remove all canes that appear weak or diseased, including all those that are thinner than the diameter of a pencil. Thin the remaining canes leaving one healthy cane every 6 in., and then prune these canes to a height of 4 ft. In early winter you should go through again, removing any long canes to prevent them from breaking in the winter winds.

With everbearing raspberries you should remove the July-bearing canes directly after completing the summer harvest. Leave the new canes unpruned to bear the fall crop. After the fall crop has developed on these canes you can cut them back to prepare for the production of next summer's crop on the same canes. Those gardeners who want a very heavy fall crop can prune everbearing varieties to the ground anytime between November and March thus eliminating the July production.

Japanese beetles can cause damage to both foliage and berries in July. Rather than spray, we pick the beetles off by hand each evening and dispose of them in a screwtop jar filled with kerosene. More irritating are the wasps that suck the juices from the fall berries, leaving them dry and useless. Last year we destroyed a couple of ground nests in the immediate area and had our first really good crop of fall raspberries.

To get your raspberries off to a good start give each new plant one half gallon of liquid fertilizer, such as you would use on houseplants, two to three weeks following planting. In subsequent years fertilize in early April using a granular fertilizer high in nitrogen, such as 10-6-4 or 10-10-10. Scratch in a couple of handfuls around each plant, staying several inches away from the cane so the fertilizer will reach the feeder roots.

blueberries

Although our blueberry crops have always been successful I decided to check my growing practices with Phil



photo by Derek Fell

Red currants

Marucci, Research Professor and Extension Specialist in Cranberry and Blueberry Culture at the Rutgers University Research Lab in Chatsworth, NJ. Before we toured the plantings, Phil gave me some background on the development of the blueberry industry in New Jersey.

Until Dr. Colville, a scientist with the USDA, published his *Experiments in Blueberry Culture* in 1910, most berries were harvested from wild bushes, growing amidst the sheep laurel, ink berry, holly and cranberry vines in the Pine Barrens. Colville's publication caught the eye of Elizabeth White, a New Jersey resident whose family operated a cranberry farm. Over the next 10 years Colville and White worked together, he providing the scientific input while White selected an endless array of blueberries from the wild, carefully documenting their origin, then propagating them for evaluation. In 1920 Colville and White introduced four blueberries – Katharine, Pioneer, Cabot and Rubel. The latter was found by Rube Leek, an employee on the White's cranberry farm.

For commercial operations Bluecrop, Blueray, Jersey and Weymouth are the most popular varieties because the bushes are productive and the berries hold up well during packing and shipping. Home gardeners can afford to sacrifice a little productivity to get the best tasting berries, and Phil suggests you search for varieties listed in the sidebar.

Make your selections to include early-mid- and late-season varieties to have a long harvest and also to ensure good pollination. In the garden you may notice that both honey bees and wild bees pollinate blueberries, with the wild bees frequently dominating the operation. At the Rutgers Research Station they discovered that as the farmers cleared more land to expand their blueberry plantings the number of wild bees diminished and consequently pollination of some varieties was poor. Renting hives of honey bees to increase pollination was one potential solution to the problem but for this to be effective the farmers must plant varieties such as Blueray and Bluecrop whose flowers contain a high volume of nectar to attract honey bees. Marucci indicates that home gardeners in most cases should have an adequate supply of pollinators because they only have a few bushes. Where blueberries are grown commercially the competition is great.

Blueberry culture is, according to Phil Marucci, easy sailing provided you start out by planting in the appropriate soil mixture. The acid soil of the Pine Barrens, with its combination of peat and sand is ideal for blueberries. At home you can manufacture an appropriate mix by adding peat, sand and leafmold to garden soil and by lowering the pH to 4.5 to 5.0. Because this low pH is so important to blueberry production I would suggest you definitely get a soil test kit from the agricultural extension agent and follow the lab's recommendations to adjust your soil to the desired pH level.

Blueberries are best planted in early spring, either as bare root stock or as potted plants. Immediately following

continued

Recommended Blueberry Varieties

Berkeley	Mid-season. Very vigorous, large bush. Hard to prune because bushes are reluctant to send up new shoots. Large, mildly aromatic berries.
Blueray	Early to mid-season. Easy to prune and grow. Large, well-flavored berries. Very productive.
Concord	Mid-season. Medium sized berry. Aromatic flavor suggestive of grape.
Colville	Late. Distinctive tart flavored berry. Excellent when fully ripe.
Earliblue	Early. Most early berries do not have good flavor. Marucci indicates this is "acceptable."
Elizabeth	Mid-season to late. Named for Miss White. Marucci says this variety is "tops in taste and will bear from late July till Labor Day."
Herbert	Late. Good, large dessert quality berry.
Pemberton	Late mid-season. Best freezing berry.
Rancocas	Mid-season. Small berry but good wild flavor. Highly ornamental, easy to prune bush.

Mail Order Sources in New Jersey for Blueberry Plants

Three Bridges Nursery, Tuckerton Rd., Chatsworth, NJ 08019

Ernest DeStefano, New Gretna Rd., Rt. 563, Chatsworth, NJ 08019

Albertus Pepper, 2nd St., Chatsworth, NJ 08019

Triple C Blueberries, 804 New Lisbon Rd., Pemberton, NJ 08068

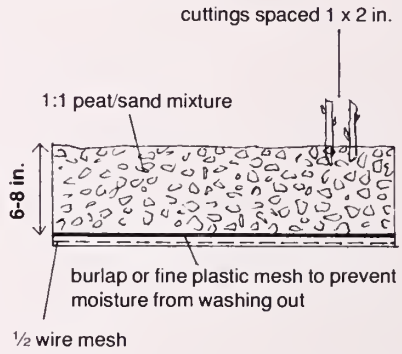
planting, fertilize each plant with a half ounce of 10-10-10. Add another half ounce at the end of May. The following year, Phil suggests you use two ounces of 10-10-10 per plant split into two applications: once around April 20 and once at the end of May. Each year you should increase the application by one ounce to a maximum of 12 ounces per mature plant. If you can locate it, purchase 10-10-10 with two percent magnesium. Spread the fertilizer evenly under each bush in a wide band several inches away from the base of the canes. If you discover your soil pH is above the optimum range of 4.5 to 5.0 on established blueberries, Marucci suggests you fertilize with ammonium sulfate using the same applications at outset as the 10-10-10 to a maximum of eight ounces per mature plant.

Purchase three-year-old bushes. Immediately following planting prune heavily to encourage good root development. Prune small canes to 2-in. stubs, leaving two to three of the strongest canes per bush. Prune these to leave three to four buds per cane. During the second winter remove any weak canes. The year you plant and the following year remove all flower buds to prevent fruit formation. Heavy pruning and removal of flower buds will delay your first harvest but ultimately you will reap the rewards of encouraging heavy root formation during these early years.

The third summer will be your first blueberry harvest and for two to three subsequent years confine your pruning to removal of dead branches. Once the plants start to mature, your goal is to rejuvenate each bush on a five- and six-year cycle by removing a few of the older canes each year. In addition, you should also remove branches that grow towards the center of the bush. Prune any time from October through mid-March.

To propagate blueberries researchers at the Cranberry and Blueberry Lab take hardwood cuttings of one-year old wood in April. They take 4-in. cuttings, the thickness of a pencil, and insert them in a 1:1 mixture of peat and sand in a 6- to 8-in. deep propagating box (see diagram). The propagating box is set on blocks in full sun and watered daily to maintain a moist mixture. Until recently Phil indicated they shaded the cuttings for four to six months. Now they get better results without shade. For a couple of weeks in mid-June at the critical time when the cuttings have produced foliage but no roots they water more frequently and mist during the middle of the day to prevent damage.

Blueberry Propagating Box



In their search for a high quality product, commercial blueberry growers must deal with an assortment of insects and diseases. For the home gardener the main concerns will be Japanese beetles and a constant feud with the blue jays and other birds that will strip the bushes before you get your first blueberry pancake. We resort to the time-consuming process of suspending black plastic nets over the bushes in late June. Despite our efforts to close up the holes that inevitably develop in the netting, the birds are remarkably persistent and we frequently come home to find a confused blue jay trapped among the bushes. Phil Marucci follows the commercial operators and sprays his home planting with the pesticide Mesurol, using three sprays on 7- to 10-day intervals starting just before the berries ripen. Marucci notes that Mesurol also helps control Japanese beetles. Sevin is an effective Japanese beetle control but Phil is not willing to use this chemical because of its devastating effect on bees. He also suggests handpicking at frequent intervals to remove Japanese beetles.

strawberries

If you have your sights set on fruit in June you will have to grow strawberries. We gave up our strawberry plot in favor of additional blueberries because the combination of strawberry runners and weeds was always ahead of us. A Wilmington area PHS member, Dick Both, apparently has no such problems and reports highly successful strawberry production.

As with the other fruits, strawberries require full sun and well-drained soil. If you plan a strawberry bed, prepare it this fall and plan to purchase bare-root or potted plants next spring. Fall planting never worked too well for us.

One of the keys to good strawberry production is crop rotation because each plant will only bear adequately for three years. Richard Both sets aside four rows, 18 in. apart, to accommodate his three rows of strawberry plants. Individual plants were set 12 in. apart in three of the four rows. The fourth row was planted with a vegetable as a filler for the first year.* (See diagram.)

That first summer Both removed all flower blossoms and runners to encourage ample leaf development on the

Strawberry Rotation

	Year 1
Row 1	Strawberry plants
Row 2	Strawberry plants
Row 3	Strawberry plants
Row 4	Vegetables
	Year 2
Row 1	Strawberry production followed by late planting of vegetables
Row 2	Strawberry production
Row 3	Strawberry production
Row 4	New strawberry planting in spring
	Year 3
Row 1	New strawberry planting in spring
Row 2	Strawberry production followed by late planting of vegetables
Row 3	Strawberry production
Row 4	Strawberry production
	Year 4
Row 1	Strawberry production
Row 2	New strawberry planting in spring
Row 3	Strawberry production followed by late planting of vegetables
Row 4	Strawberry production

*Avoid planting solanaceous crops such as tomatoes, eggplants and potatoes where you will plant strawberries. These crops may leave fungus spores in the soil that will later cause wilt diseases in the strawberry plants.

mother plants. The following spring, to get his rotation plan underway, Dick planted an additional row of strawberry plants in the section occupied with vegetables the previous summer. In July following a successful crop in the three original rows, he removed one row and planted this with late-maturing crops such as string beans, carrots, spinach and lettuce. In subsequent years he continued this strawberry/vegetable rotation renewing each row once every three years to maintain peak production.

To maintain an orderly strawberry bed and to encourage maximum leaf development on the desired plants, Both removes runners as they develop and renews the plants annually by mowing them after the crop has been picked. To avoid injuring the crown of the plant, Both sets his rotary mower at a height of three to four inches. To reduce potential outbreaks of disease he rakes and burns the leaves after mowing.

Strawberry plants require an annual dose of fertilizer, one handful of 10-10-10 per plant immediately following bloom. Both summer and winter mulches are also important. Use straw, hay or chopped leaves as a summer mulch, laying it between the rows in May to discourage weeds and to keep the rain from splashing mud on the berries. In late fall, after a couple of hard frosts, cover plants with a mulch of salt hay or evergreen boughs. This winter mulch will protect the plants from alternate freezing and thawing and subsequent heaving and should be left in place until mid-April.

Both notes that you should always purchase certified disease-free strawberry plants and suggests the following varieties for Delaware Valley gardeners: Fairfax (mid-season), Catskill (mid-season) and Guardian (mid-season). Both no longer grows early varieties because flower buds are frequently damaged in this area by late frosts.

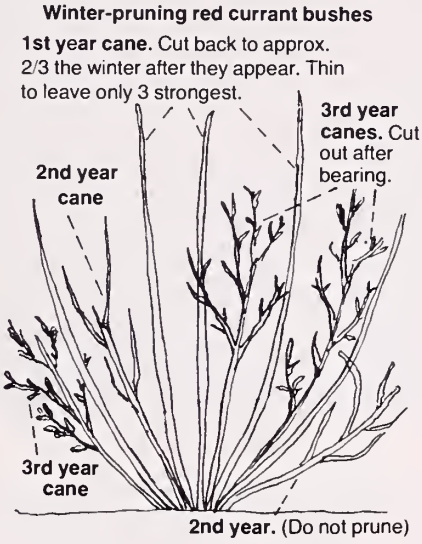
red currants

Both Dick Lighty and Dick Both also recommend that gardeners in this area grow red currants, which are excellent cooked or cooked and then frozen or made into an exotic red currant jelly called Bar-le-duc.

Red currant bushes will flourish in a well-fertilized soil, high in organic matter. Set out three to four plants per family in early spring, spaced 4 ft. apart. Both Lighty and Both recommend 'Red Lake.' White fruited varieties are also available.

After a couple of years' growth red currant bushes will have to be prunned annually, either in late fall or early spring. Red currants bear for the first time on second year wood and again on the same wood during the third year and then, because these canes lose vigor and the yield drops off, they must be

Winter-pruning red currant bushes



removed at ground level. Following a crop in any given year you should have a maximum of nine canes per plant. The next winter you will remove the three oldest canes (see diagram) and cut the rest of the canes halfway to the base to encourage branching the following season. In early March give each plant a generous handful of 10-10-10 fertilizer. Because they are shallow rooted plants do not cultivate the surrounding soil. Mulch to avoid weed growth.

Once you get your small fruits into full production you may find yourselves with riches beyond what you can consume before it's time to start picking again. Making jellies and liqueurs (see recipes) is one way to preserve the crop. In addition, all these fruits hold up well in the freezer. We lay our raspberries and blueberries out on trays, in single layers and place them in bags once they are frozen. Raspberries taste best when defrosted slowly in the refrigerator with sugar. Blueberries are dull if eaten directly after unfreezing so we bring the berries to the boil over a slow burner with a little honey and lemon peel and let them simmer for a couple of minutes before serving them over ice cream.

Recipes

Bar-le-Duc – Red Currant Jam

Ingredients:

- 1 pound red currants
- 3 cups sugar
- 1½ cups water

Wash and destem currants. Purists may remove currant seeds by piercing bottom of each fruit with sharp toothpick and squeezing out seed through opening. Dissolve sugar in water and heat syrup to soft-ball stage (238°F). Add currants to syrup, bring to boil and cook one minute. Pour mixture into small sterilized jars. Seal and store.

This is an excellent light dessert when served with cream cheese and toasted crackers.

Raspberry Liqueur

Ingredients:

- 5 pounds ripe raspberries
- 2 quarts 190 proof alcohol
- 1½ quarts water
- 2 pounds sugar
- 1 pint Kirsch

Put whole raspberries in crock or glass jar with all the alcohol and leave standing two months, covered. After two months strain juice through fine sieve. Do not mash but try to press most of juice through. Filter juice again through jelly cloth.

Mix sugar, water and Kirsch and add to filtered juice. Bottle in size preferred. Date and label. If possible, wait one year to drink.

Yield – 11 to 12 pints

Recipes supplied by Richard J. Both

Blueberry Pancake Pie

Batter:

- 2 eggs
- 2 cups milk
- 2 cups flour, salt

Divide ¼ lb. oleo, melted, in two warmed bread pans. Beat batter well and pour into pans. Bake 45 minutes at 375°. It should puff up to 2/3 height of pan. Remove from pans and cut in one (generous) pint blueberries mixed with ¼ cup sugar. Return to oven and continue baking at 375° for 15-20 minutes. Serves four.

Recipe supplied by Sally Lighty from Harriet Hemenway, Stonington, Maine

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Jane Pepper is executive director of the Pennsylvania Horticultural Society. Her weekly gardening column appears in the Arts & Leisure section of the *Sunday Inquirer*.



photos by Sally McCabe

The Southwark/Queen Village Orchard has cherry, apple, apricot and peach trees.

A PRIDE OF FRUIT TREES

A Community Orchard in the City

by Libby J. Goldstein

I'm really not sure how the Southwark/ Queen Village Demonstration Garden got into growing fruit. As its first coordinator, I had already stuffed dwarf apple and apricot trees, blueberry bushes and two 'Golden Muscat' grape vines into my 15 ft. x 15 ft. backyard with the help of Conrad Weiler, then president of the Queen Village Neighbors Association. (I told Conrad we were digging for artifacts, which is how the tree and bush holes got 3 ft. deep and could be filled with peat and bagged topsoil, manure, phosphate rock and green sand.) Meanwhile, Conrad was following local South Philadelphia custom and planting fruit in his yard, too. When we moved the community garden to its new site on Christian Street in 1976, we immediately thought there should be an orchard. Maybe it's because Queen Village was planning to secede from Philadelphia for the Bicentennial, and we needed not only vegetables but fruit, if we were to survive as a City State.

Anyway, when we wrote to Penn State to apply for federal Urban Gardening Program money in the fall of '76, we mentioned starting an orchard, as well as a community cannery, and either a vineyard or a woodlot on the banks of I-95. By the spring of '77, Penn State had decided it was better to hire me to run the Urban Gardening Program than to have to listen to Conrad and me and our mad plans. Our ward leader was also tired of listening to us and arranged to have the Philadelphia Housing Authority remove tons of concrete from our site. Lo and behold, we had a place for the orchard, the resources to dump 30 yards of spent mushroom compost on the site and four trees. The demonstration orchard was all set to go. Since a surprising number of Philadelphians grow fruit, it is a place to show how to plant and care for their trees, vines and bushes. (The Pennsylvania State University Cooperative Extension Service Urban Gardening Program has since planted trees and small fruit at several other demonstration gardens. For information call 224-1821.)

The first four trees were 'Sun' and 'Moongold' apricots and 'Esopus-Spitzenberg' and 'Wealthy' apples on dwarfing stock. We planted one of each so that we would have good pollination and fruit set. The apples are two old varieties as befits our historic neighborhood. Thomas Jefferson grew Spitzenbergs and besides, they are still a super dessert variety – beloved of aphids as well as people. We chose apricots because they're often hard to find in the market, and when you do find them, you need a sack of silver if you are to take any home.

Growing fruit well requires careful pruning and pest control and is a bit more complex than growing vegetables. While the flavor of fruit picked at its peak is absolutely unequalled, it does seem like a lot of work to grow stuff you can buy at the corner store or pick at its peak

at farms all over the Delaware Valley. That's why most of our demonstration gardens sport unusual cultivars and fruit like apricots, pie cherries, raspberries and currants; fruits that are not often grown for fresh market sales.

Still we have added peaches. Peaches like the white-fleshed 'Early Red Fire,' 'Stark Early White Giant,' 'Belle of Georgia' or 'Laterose,' which are hard to find in the market. Of course, raw white-fleshed peaches only have about 50 International Units of vitamin A per 100 grams, while yellow ones have about 1330 I.U. If vitamins are important to you, you may not care whether you can buy white-fleshed peaches or not, and if your goal is an entry in the Harvest Show, stick to yellow-fleshed peaches for jams and preserves. I have it on good authority from a perennial exhibitor that her white peach jam never makes it, no matter how pink and perfect she thinks it is. For peeling and plunking in a coupe of champagne, however, nothing beats a white-fleshed peach.

the peach tree borer

It seems that nearly everyone in Philadelphia who grows peaches, grows peach tree borers. There are nearly as many calls to Penn State's Garden Phone about peach tree borers as there are about blossom-end rot on tomatoes; a lot.

Whether you're growing peaches, apricots, cherries or nectarines, the peach tree borer, *Synanthedon exitiosa*, a native American, is quite likely to make you nuts at some point. You will come out to admire your favorite tree and find all kinds of gunky gum and sawdust (frass) squishing out of the bark near the soil. It looks just awful, and it's really bad for the tree. Not everything that looks bad is bad in terms of plant growth and productivity. Borer damage, however, is bad. Borers can kill young trees by girdling them entirely as they did at the Chinatown Community Garden, and they can seriously weaken older trees and make them susceptible to a whole host of other insect and disease problems.

Maybe it's because Queen Village was planning to secede from Philadelphia for the Bicentennial, and we needed not only vegetables, but fruit, if we were to survive as a City State.

Adult borers are clear-winged, day flying moths that are easily mistaken for wasps. The female is steely-blue with an orange band on her abdomen and opaque forewings. The male is smaller with clear wings and three to four narrow, yellow stripes on his abdomen. Adult borers emerge from cocoons in the soil from mid-July into October, but emergence peaks in August.

Damage is done by the larvae, which begin hatching from their eggs in mid-July and immediately start burrowing into the bark (through a crack or wound near the soil), feeding on the cambium and tunneling between the bark and the sapwood. To control the larvae, you may want to treat the trunk of your tree with two careful applications of Lindane, one made about July 15-20 and the other between August 5-10. You can either spray or brush the material on the trunk. Soak the bark and wet the tree from the crotch to the ground. Spray the soil at the base of the tree, too. Be sure to follow the directions on the label. (See also "Controllng Insects and Diseases," page 25.) Larvae are white to cream color and have yellowish-brown to dark brown heads. They usually hibernate in the tree and mature the following season, so you can find them under the bark where they've left their gunk anytime during the year. They can be dug out with a wire or coat hanger.

Adults, which can normally be found on the trunk and lower branches from July to October, will be controlled by well-timed, thorough applications of an all-purpose fruit tree spray. Their emergence is often controlled by removing some soil from the base of the tree and applying moth crystals in the fall since the larvae enter the soil to spin their cocoons and pupate.

We have also added sweet cherries to the orchard, and won a Montmorenay cherry donated by the Society at the Harvest Show. All of our trees are on dwarfing stock. We chose 'Dwarf Stella' as our sweet cherry because it's small *and* self-fruitful. Planting in pairs for pollination can become a problem in small spaces.

brown rot

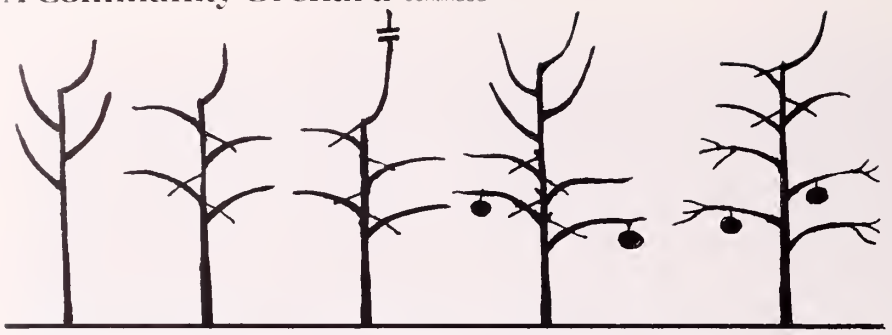
All of these stone fruits are susceptible to brown rot *(Monilinia fruticola* and *Monilinia laxa)*. We have yet to experience it at Southwark/Queen Village, but I have a friend (we'll call her Mme. X) who absolutely refuses to spray her peach tree and if her peaches are not turned into pies and jam the instant they're picked, they develop vile, moldy, brown patches and must be pitched. Brown rot fungus can and does infect both blossoms and twigs. Infected flowers obviously reduce fruit set, but worse, it increases the amount of fungus hanging around to get your fruit. Twig infections can girdle and kill the twigs. They happen when blossom or fruit infections creep down the stem and into the twig.

Mummified fruit and infected twigs should be removed from the tree and from the soil around the tree and put out with the trash or burned. **Do not compost** them or you'll just be growing more fungus. The fungus can be controlled by spraying with Benlate, 1 Tbs. 50% wettable powder per 2.5 gallons of water just before the blossoms open, at full bloom, at petal fall (when 90-95% of

continued



An apple tree with ties and spreader to control shape.



Limbs with spreaders. One year stock can be trained with clothespins – spring type.

petals have fallen), three weeks before harvest and one week before harvest. Benlate can be used on cherry trees right after harvest. Other stone fruits won't need a post-harvest spray. Dusting or spraying with sulphur just before the fruits start to ripen may also prevent brown rot. If you can't or won't spray, imitate Mme. X and gather your friends to pick and process your fruit as soon as it's ripe.

children

Actually, the major fruit pest in our Southwark/Queen Village orchard has been our kids who seem always in need of missiles to hurl at one another. Control methods for the young vary, but adults emerging from the shade of the trees at the first indication of potential invasion appear to be an excellent biological control. On one occasion, Prince Pressley emerged with a 2 x 4 in hand. It was really effective; although control of that sort may be unacceptable on ideological grounds.

pruning

Children, however, provided us with a good opportunity to practice training and pruning on the 'Esopus-Spitzenberg' apple. They broke the tree, leaving a single leader which I cut back to undamaged wood and proceeded to train using Professor Ritter's Penn State publication, Training Apple & Peach Trees and the *Fruit* volume of Simon & Schuster's *Step-by-Step Encyclopedia of Practical Gardening*. As you can see from Professor Ritter's illustrations, we have used both winter and summer pruning. Henceforth, we shall prune the apple trees (not peach) mostly in winter to control tree height by cutting back the leader and letting a new one form and to encourage spur growth on last summer's laterals. (See charts with "Pruning Fruit Trees" on page 20.)

When she held a pruning and training workshop on the Southwark/Queen Village Garden in March, Jeanie Polefka, our newest garden adviser, decided to open the crotch angles on the 'Spitzenberg' before it got too old (see drawing). We had been using homemade spreaders to encourage the young scaffold branches (main branches as opposed to lateral) to grow out instead of up. Wide crotches are stronger than narrow ones and are more resistant to breaking. This is especially important when you're expecting immense crops of fruit to weigh the branches down year after year. Besides, fruit trees seem to think that vertical branches should have leafy vegetative growth while branches that grow more horizontally should have lots of flowers and thus fruit. We want the tree to think fruit. And we want the fruit and leaves to get all the sunlight they can. Since our wonderful used-lath spreaders kept springing out of the tree, they haven't quite done the job. Jeanie decided that restraints were in order; scaffold branches were tied to the trunk or to rocks and bricks so that the angle of the scaffolds would be about 45°.

Peach and nectarine trees can be trained to a modified leader system. Since their growth habit is less vertical than apples and pears, they usually will not need to be tied down. Once the basic form is set, summer pruning will keep the tree at a reasonable height for safe picking. After harvest, New Jersey growers drive down the rows with flat bed trucks, carrying men with chain saws and just cut all the branches over a certain height. It's rough; it's tough, but it does the job. Spring pruning (after growth starts) encourages new vegetative growth. Summer pruning doesn't. If you're growing peaches to eat, why grow them up in the sky – unless you're feeding angels or squirrels or some such.

the community

Sixty-three families work in the Southwark/Queen Village Demonstration Garden. The orchard has 11 trees; the most recent ones were presented to us this spring by Stark Bro's. Clearly we have too few trees and too many people to make our orchard a really efficient operation. Still it is fun, and it is teaching us a lot. The great April freeze, especially, enhanced our sense of fellowship with all of the Delaware Valley's fruit growers, whether they are farmers or gardeners. And the orchard is very, very beautiful. If it hasn't yet provided much food for the belly it certainly has provided a great deal of food for the hands, mind and soul. You just can't put a price on the pride we all have in our orchard. Nor can you compute its symbolic value to Queen Village as a community. To all of us it is "the first ever (we think) community orchard in the whole United States, whether it is or not." [Ed. note: They are unshakable in this undocumented assertion.]

Publications

Two excellent publications on pest management with super pictures of insects, diseases and their effects are:

Tree Fruit Insect & Disease Fact Sheets – 17 separate sheets on 4 diseases and 13 insects. All 17 in color, cost only $2.50 and can be ordered through: IPM Programs, New York State Agricultural Experiment Station, Geneva, NY 14456.

Tree Fruit Insects, North Central Regional Extension Publication #63, pictures, management of the pests and monitoring methods all for $3.50 from: Publications Office, Michigan State University, East Lansing, MI 47724, or NCR Educational Materials Project, 111 N. Curtis Hall, Iowa State University, Ames, IA 50011.

Pruners in Pennsylvania will want to ask their county extension office for a free copy of *Training Apple & Peach Trees.*

Container growers can get a copy of *Container-Grown Fruit Trees* free. Call Penn State's Garden Phone, 224-7870.

Penn State also has two correspondence courses for fruit growers. The books themselves are worth the price, even if you don't send the answer sheets to PSU for grading. The courses are:

#74 Home Garden Fruits, 7 lessons, $6.00

#75 Small Fruits, 9 lessons, $8.50

Order from: Correspondence Courses, The Pennsylvania State University, 307 Agricultural Administration Bldg., University Park, PA 16802.

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Libby J. Goldstein is a Southwark/Queen Village gardener. She is coordinator of The Pennsylvania State University/Cooperative Extension Service Urban Gardening Program. She has written the City Gardener column for the *Philadelphia Daily News* for the past five years. She has progressed as an exhibitor at the Harvest Show from winning second place as the only entry in a class to winning a bronze medal in a class of over two hundred entries (for her vinegar collection).

FRUIT IN POTS

by Ernesta D. Ballard

Container gardeners throughout the ages have been intrigued with the notion of a fruiting tree in a handsome pot. We see potted citrus in Spanish gardens and at Versailles. We see crab apples and pomegranates and persimmons grown as bonsai. We read about the latest developments in dwarf fruit trees. And we ask, can I enjoy a miniature orchard on my terrace or sunporch?

The answer is "no" and also "yes." In the Delaware Valley, it's not realistic to think of producing apples and pears and peaches for your family out of pots and tubs. The climate is wrong. But it is realistic to bring a wide variety of container grown trees and shrubs into fruit and to enjoy the sight, the feel and, occasionally, a taste. Let me give you some examples.

Starting with fruits for eating, I think first of raspberries. If you can keep the birds away, a half-barrel planting will produce enough berries to garnish your breakfast cereal every other day for two or three weeks. There are no tricks; just adapt the directions in any gardening text. (See "Small Fruits" by Jane Pepper, page 10.)

I've also had pretty good luck with strawberries, both the dwarf alpine varieties (from seed) and the everbearing 'Ozark Beauty.' I grow 'Ozark Beauty' in a large strawberry jar, replacing the plants every other year with runners from a friend's bed. When it comes to the alpines, 'Baron von Solemacher' is great for pots, strawberry jars, in rock gardens and as an edging plant. The berries are small and scanty – but tasty. Like all herbaceous plants, strawberries must be renewed every year or two.



photos by Edmund B. Gilchrist, Jr.

Apple (*Malus* sp.) 'Red Jade'

Another plant in the eating category is the so-called 'Smyrna' fig, *Ficus carica*. Liberty Hyde Bailey summed it up: "Makes a fine pot plant, and fruits freely in northern conservatories." Mine is twelve years old. It grows in an 18-in. pot, spending the summer in our kitchen courtyard and the winter in our fernery, a north facing greenhouse of sorts, with enough heat for camellias and oranges. In a good year it produces a hundred or more figs, juicier than you can buy in the store but, because they have not been fertilized, they lack the nutlike flavor that comes from fully formed seeds. Since the only practicable agent of fertilization is a wasp that doesn't live in the mid-Atlantic states, there is no way to remedy that. The plants have a somewhat rangy way of growing, but you can restrain them by pruning.

The only other container fruit I have grown for eating is a melon. It was only a partial success. I found that I could get two or three small melons from a bushel-sized tub, but I couldn't enjoy both the sight and the taste because of white fly. If I wanted the melons to look beautiful for the Harvest Show, my main reason for growing them, I had to spray regularly with a strong insecticide, which made them inedible as far as we were concerned. The unsprayed ones were reasonably tasty, but bedraggled.

don't touch

When we move from eating fruits to those in the "you can look, but you mustn't touch" category, the choice is much wider. Start with citrus: oranges, lemons, limes, kumquats and so forth. The ones that have done best for me are the American Wonder Lemon and the Otaheite Dwarf orange. My lemon is more than 80 years old and my orange is approaching 50. Both belonged to my

continued

grandmother. Like all my non-hardy trees, they spend the summer on my terrace and winter in the fernery. If you're tempted to grow one, don't start with a seed from your breakfast fruit. Rather, take a cutting from a fruiting tree or buy one. (Burgess Seed and Plant Company* lists five different kinds.) Seedlings rarely bear anything but sentiment, the only exception I know of being the spectacular orange grown by PHS member Morris Brownell, which finally bloomed and fruited at 20 years.

Another group grown for appearance is apples and crab apples, both of which are covered with lovely blossoms in the spring. The crabs fruit readily; the apples sparingly. The plant in the picture was in the 1979 Harvest Show. Its single apple lasted long enough to be photographed, but fell off when touched by one doubting Thomas too many. These trees are often grown as bonsai, but are equally adaptable to training as standards, espaliers, cordons or other topiary forms.

The most spectacular fruiting plant we've ever had is the Concord grape pictured here. It died several years ago for no obvious reason, a reminder that container gardening requires a touch of fatalism. We are growing another, but, so far, have been unable to get it to bloom.

Mrs. John Lockwood, an expert horticulturist from New York and a frequent judge at the Philadelphia Flower Show, grew the large pyracantha in the picture. My small one, grown as a bonsai, had been in its pot for four years when the picture was taken.

In my indoor plant collection, I have three fruiting plants worth mentioning. They are mistletoe fig, *F. del toidea,* a dwarf pomegranate, *Punica granatum* 'Nana' and *Ardisia crenata,* the coral berry plant. The pomegranate is at its best in summer when it blooms profusely and then sets four or five fruits the size of ping-pong balls. The plant pic-



photos supplied by author

Dwarf pomegranate (*Punica granatum* 'Nana')

*905 Four Seasons Road, Bloomington, IL 61701



Everbearing strawberry cultivar grows well in a large strawberry jar.



Pyracantha coccinea grown by Mrs. John Lockwood



Crab apple (*Malus floribunda* hybrid) 'Red Jade'

tured is about 40 years old. The fig is a popular houseplant. You will see specimens up to three feet tall and others, like ours, grown as bonsai. It always has some fruits, except for a few weeks each spring after it's been heavily pruned. Ardisia is popular among indoor gardeners because it can be relied on to bloom and fruit each summer.

Finally, I must mention a beautiful little plant named *Nertera granadensis,* the bead plant. It is a tiny creeper, much like babys-tears, but with beguiling orange fruits. Park sells seeds of *Nertera* and I have found plants at Waterloo Gardens. It's one of those not quite hardy species that needs a cool damp winter, so you should winter it in a greenhouse or cold frame with only enough heat to keep the temperature above freezing. It won't do as a houseplant.

I suppose a review of fruiting plants grown in pots should mention the ornamental cherries and peppers that are sold in great quantity throughout the winter. I've grown them from seed and given them away for Christmas presents. However, they are difficult to grow well unless you have a greenhouse, so I would not recommend giving them windowsill space.

cultural practices

Cultural practices are the same for a fruiting plant as for any other. The key is a container with a large drainage hole and a growing medium with enough organic matter to retain moisture and enough sand to keep the medium from packing too tightly. Periodic examination of the root ball will tell you if the plant is potbound. If it is, you have to do something – put it in a larger pot, or prune its roots and return it to the pot. My plants are all grown in the smallest pots possible for their size. This saves wear and tear on the back, but it necessitates more frequent watering. It also makes overwatering virtually impossible. It's essential not to let plants with flowers or fruit dry out. If they do, the blossoms or fruit will probably fall off.

What it all adds up to is that fruiting plants grown in pots are fun, decorative, and sometimes good to eat. You will find that they evoke admiring comments and occasional gasps of disbelief from your visitors. And to you they will bring an abiding sense of achievement and satisfaction.

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Ernesta D. Ballard was executive director and president of the Pennsylvania Horticultural Society from 1963 until 1981.

PRUNING FRUIT TREES

by John Rayburn

Fruit growers, both amateur and professional, have their moments of doubt about correct pruning practices. Every one who prunes fruit plants has a preferred method, but even experts often wonder if they are making the proper cuts. Although much latitude is permissible in selecting the parts to be removed or kept, it is essential to follow some basic rules. Properly pruned plants will have a good form, will bear young, and will continue bearing into old age.

We prune fruit trees and shrubs to develop desired shape; to maintain desired size; to make spraying interior limbs easier; to improve fruit quality; to improve tree strength and to induce branching.

Excessive pruning encourages rampant shoot growth and reduces the quality of fruit on young trees. Older trees (25 years and up) produce better quality fruit following a vigorous pruning. Be sure to remove all dead or broken limbs when you prune, and remove sucker growth from the interior of the tree and around the base of the trunk annually.

pruning systems

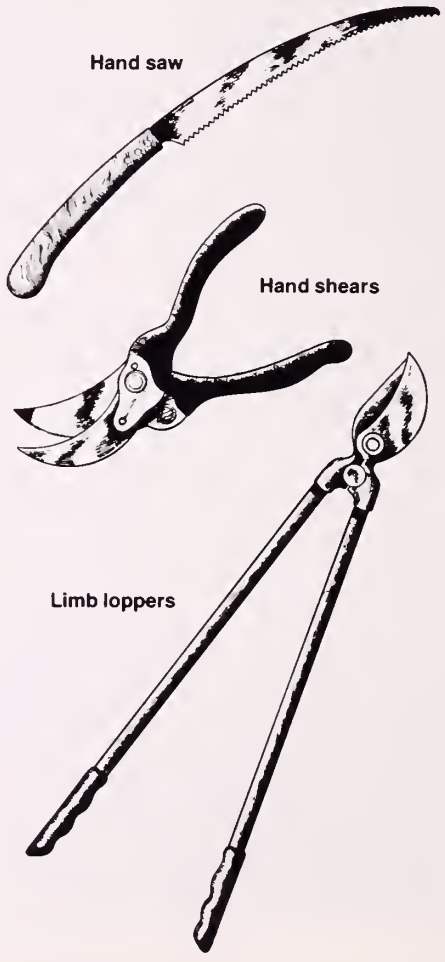
Three quite different approaches to pruning are:

Central leader system. As the name implies, the tree has a central trunk with a number of major limbs branching outward at various levels. The center of the tree is shaded, so for maximum production the limbs should be spaced no closer than 12 to 14 in. apart. On the other hand, the tree tends to be very strong, holding the weight of a crop well and standing up to harsh weather conditions. This is the most popular system of pruning in the Delaware Valley, used mainly for apples and, to a lesser degree, for plums.

Modified or vase pruning system. This tree has a short trunk and then spreads outward with three or four main limbs. These in turn branch with five to seven secondary limbs. The center of the tree is open so that light penetrates and encourages fruit on the lower branches. This shape is used with peaches, plums, pears, apples, cherries, and, in protected spots, apricots.

Trellis-trained or espaliered system. This approach is similar to that used to train grape vines. Most commonly, branches from the central stem are trained along three wires one above the other. To assure maximum sunlight on the lowest branches, the bottom limbs should extend beyond the limits of the overhanging branches. This system is becoming increasingly popular with apple trees and, occasionally, with pears and peaches.

Three basic tools needed for pruning



pruning and care of trees at planting time

Until planted, fruit trees should be kept in a cool place covered with moist burlap. The pruning of newly-set nursery stock is a minor operation. Remove injured roots and shorten those that would make it difficult to place the remaining root system in the prepared hole.

On peach trees remove the lateral branches to make the tree a straight whip. If you plant peach trees in the fall, do not prune until the following spring to avoid injury. The height of heading back (cutting) peach trees is a matter of individual preference, but heading trees at 20 to 24 in. will result in a satisfactory top framework for the mature tree.

Many people ask where one finds the fruit buds before pruning. On apples, pears, and plums, the fruit will bear on the two- to four-year-old wood. On peaches and nectarines, one year's growth forms the next year's fruit buds.

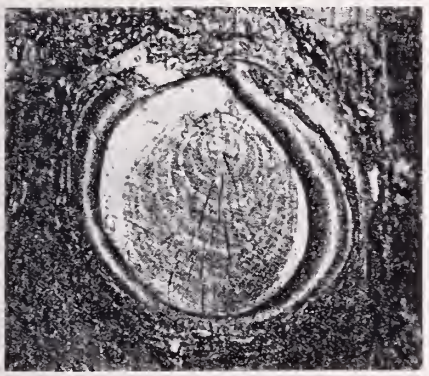
Spur-type wood also bears on two to four-year-old wood. The spur is a short, woody stem less than 4 in. long that bears the principal flower clusters then fruit. Although not all varieties are available in the spur type, those that are are desirable because they produce less sucker growth so there's less pruning. While it may take spur trees two years longer than non-spur types to come into production, the trees frequently are heavier bearing. The fruit forms at the tip of last year's spur growth, and the spur itself then grows a bit more, off to the side of the fruit. The straight spur at the right has not yet borne fruit, so be careful when picking.

making limb cuts

Use sharp cutting tools at all times, making cuts clean and smooth. Ragged cuts heal slowly. Stubs do not heal and will decay, which may eventually enter the trunk of the tree and weaken the entire structure. Cut back to limb surface; the wound will heal over satisfactorily.

types of cuts

Thinning-out in pruning is used where entire branches are removed. The underlying principle is to admit more light and to remove unproductive branches that are producing few, if any,



A good cut. The wound healing over.

desirable fruit. It is used in younger trees.

Heading back. A stimulating (purely vegetative) cut, made by cutting back to desirably situated side branch. This cut is used on older trees and in renewing an area of a tree damaged by storm or pests.

Thin-wood pruning is the removal of slow growing, weak, underhanging branches or spurs that are either not fruiting or are producing fruit of low quality.

Cutting to lateral branches is making the cut in line with the side branch. The objective is to keep the sides of the tree within bounds and to lower the tops of tall trees so that they are within easy and more economical range for pruning, spraying, thinning, and harvesting. Also, branches that droop to the ground or those that grow closely parallel on top of other limbs are often cut back by this method to an upward or outward-growing lateral. Such cuts do not dwarf the branch as much as heading-back cuts. It is also important that no side or scaffold branch be permitted to develop as fast as the central leader limb. If a fast growing side branch has a wide angle in the crotch, is properly located, and is worth keeping, its rate of growth can be checked by pruning back and thinning out the remaining laterals. Such pruning will assist in dwarfing it to a lateral and permitting the leader limb to grow upward and a few inches ahead of all side limbs.

pruning young apple trees

When planting apple trees, select trunk calipers of between 5/16 in. to 3/4 in.; trees of larger size may not survive. When transplanting, reduce the top by one-fourth.

The rule for pruning young apple trees is "prune lightly," especially for the first five years. Initial concern should be with the main leader development of a tree. Leave the small branches and spurs on the young tree, for they are the wood upon which the first fruit will develop. Since every tree presents a different problem in pruning, nothing will substitute for common sense in making cuts. For the beginner it will be necessary to study the tree carefully before making, or not making, the cut. It's also not a bad idea to have an expert on hand the first time. After considerable experience, pruning becomes second nature.

Actually, pruning is a fascinating game. The following suggestions are given for making cuts on young apple trees:

1. Remove first the dead, cankered, broken, or badly diseased limbs.
2. Remove as soon as possible (if they can be spared) branches that grow from the leader at a narrow angle. These limbs are entirely unsatisfactory for permanent scaffolds.*
3. Scaffold limbs may crowd each other. Either remove one or shorten it to a lateral that will be stunted or removed eventually.
4. Scaffold limbs grow closely parallel, one above the other. If two limbs are concerned remove or dwarf the weaker, preferably the lower, by heavy pruning. Leave about 4 ft. between scaffold limbs one above the other.
5. Avoid double leaders or whorls of limbs on the main leader and scaffold branches.
6. Remove water sprouts, unless they are needed to develop scaffold limbs in open areas of the tree. Sometimes these water sprouts can be used to form a natural brace for sharp-angled crotches which, unfortunately, have been allowed to develop.
7. Keep the central leading limb growing about 6 to 10 in. above all lateral limbs. At the age of six to eight years, modify the leader and begin to open the top by cutting the leader back to a strong side lateral. This should be done only after four to six strong scaffold limbs have been developed.
8. On the fruiting limbs, rejuvenate new limb growth every two to three years to keep tree producing.
9. Remember that some varieties are alternate bearing, with heavy crops only every other year.

pruning pear trees

Prune pear trees after they go dormant in the fall, from December through April. In areas where fire blight is not so likely to be a serious problem, three or four main scaffold limbs may be left. However, where fire blight is a problem, as it is here in the East, it is recommended that about six scaffold limbs be left in the event that subsequent fire blight infection may necessitate the removal of some of the branches. Light pruning is recommended, especially in humid areas because blight is more difficult to control on trees making soft growth as a result of heavy pruning. It is characteristic for most pear varieties to grow strictly upright and not to branch freely. Use of heading-back cuts on outward-growing branches should be kept to a minimum because they encourage a profusion of soft terminal shoots. It is best to confine most of the cuts to the thinning out type.

peach, nectarine, apricot

Prune all stone fruit trees in late spring, preferably after growth has started. Peaches, nectarines, and apricots should not be pruned during the fall or winter months because of canker. Valsa canker can invade twigs, limbs, or the trunk of the tree through pruning wounds, dead twigs, brown rot cankers, and winter injured areas. In pruning out diseased wood, disinfect pruning shears with chlorine bleach between cuts.

There may be special problems in starting the head because, in some cases, a large part of the top may die in recently planted trees due to winter injury during the first year or because of an excessively dry period the first summer after planting. Under these conditions, a vigorous shoot may appear dur-

continued

*Scaffolds: the main branches that grow from the trunk, usually somewhat horizontal.

ing the course of the season near the base of the tree and outgrow the originally selected trunk and laterals. This vigorous shoot can be used to develop the new head provided it arises above the point where the seedling root was budded in the nursery. A new framework should be created from this vigorous shoot and the old head removed flush with the base of the vigorous growth.

summary

Pruning is important for the best possible fruit production. Cut out crossing, crowding branches that keep sunlight from reaching the interior of the tree. Retain two- to four-year-old wood. Rejuvenate the tree with proper pruning every two to three years to keep it in continuous and top production. There seems to be good evidence to suggest that slightly harder pruning than was once recommended eliminates excess fruit production, so that what is there will be the best in size and color.

Pruning is not the only consideration in fruit production, but it is one of the most important. Master it successfully and you'll reap rewards as satisfying as any available to the home gardener.

For Further Information:

Modern Fruit Science by Norman F. Childers, Rutgers University, 1973.
All About Growing Fruits & Berries, edited by Will Kirkman, Ortho Book Series, 1976.

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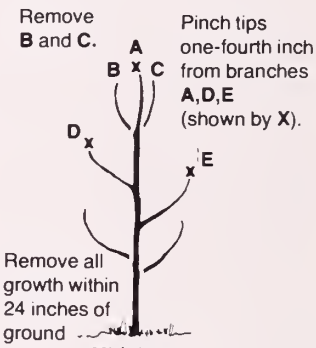
John Rayburn has been pruning fruit trees for the past 18 years and says he is constantly discovering improved techniques. In addition to taking care of the fruit trees and vegetables at Longwood Gardens for the past 15 years, John has his own orchard of 1000 peach trees, 100 apple, 100 pear, and 100 plum trees.

Training apple trees (branch designations – **A, B, C** – are the same in all sketches)

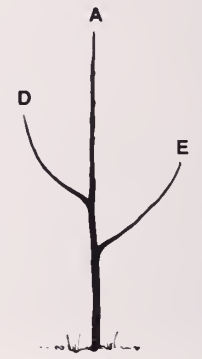
YEAR 1



At planting

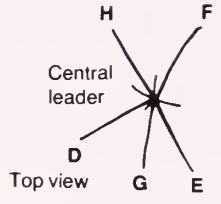


Mid-June

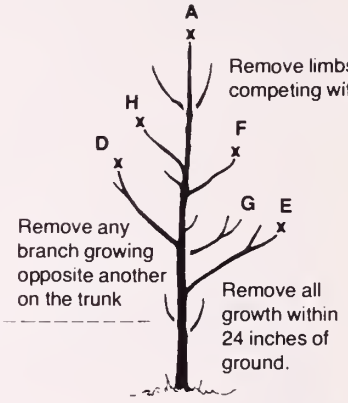


Continued growth during 1st summer

YEAR 2



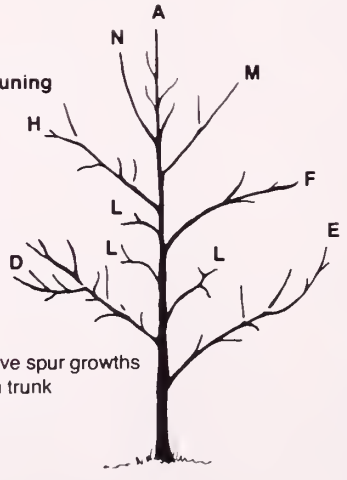
April



In mid-June of 1st and 2nd year. When new shoots are 5 to 6 inches long, pinch one-fourth inch from branches **A,H,F,D,** and **E.**

YEAR 3

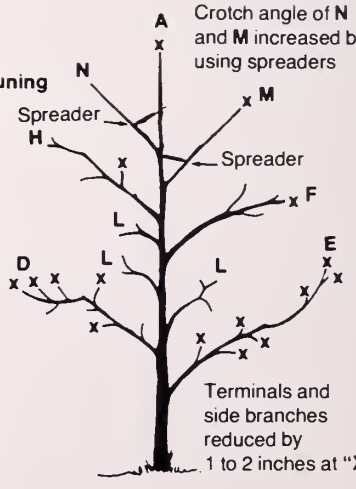
Before pruning



During third and fourth years, grower must decide on final tree size, as by this time major (permanent) scaffold branches have developed. Subsequent prunings are for maintenance or repair only.

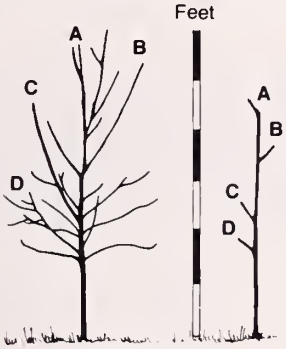
April

After pruning



Courtesy of The Pennsylvania State University, Extension Service, C. M. Ritter, Professor of Pomology

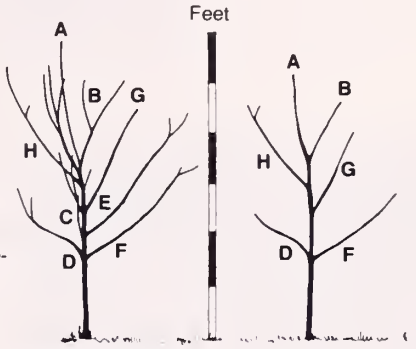
Training peach-nectarine to modified leader system



At planting

At planting time

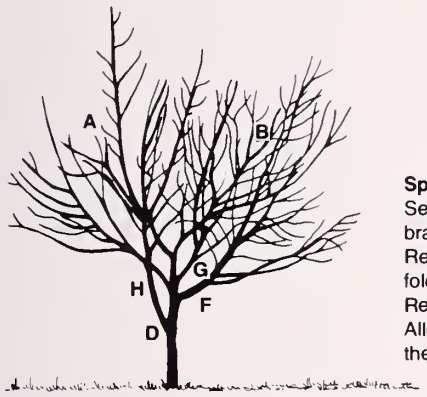
- Remove all broken limbs. Select 3-4 branches for main scaffolds. Reduce to 2-3 buds in length **(A,B,C,D)**.
- Select the remaining branches that are 5-6 inches apart vertically on trunk and equally spaced around trunk.
- The top branch should be at about 30-36 in. and bottom branch at about 20 in.



Spring 2nd year

Spring of 2nd year

Limbs **A,B,** and **D** retained. New limbs **H, G,** and **F** kept.
Original limb **C** cut off; also, new limb **E** removed.
Shorten **A,B,D,G,H,** and **F** by 4-5 inches.



Spring 3rd year (6-7 feet tall)

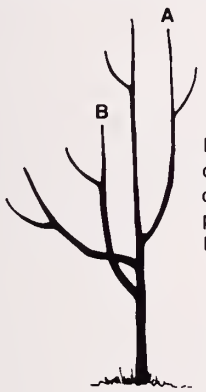
Spring of 3rd year

Secondary scaffolds have developed on branches **A,B,D,G,H,** and **F.**
Remove about ½ of the new secondary scaffold branches.
Reduce remaining limbs by 4-5 inches.
Allow new shoot growth to develop during the coming summer.

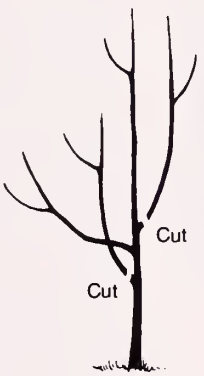
Spring of 4th year and thereafter

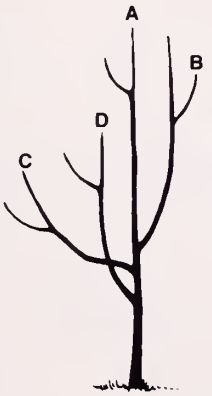
Keep position of main limbs **A,B,D,G,H** and **F** in mind.
Permit 2-3 secondary scaffolds to remain on each main limb.
Permit about ½ of the shoots to remain on each secondary.
Space the new shoots as nearly as possible evenly over each secondary.

Pruning trees: thinning out vs. heading back

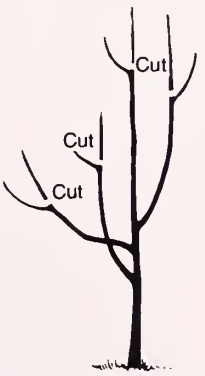


Limbs **A** and **B** were *thinned out* by cutting flush with main branch or central leader. This type of cut promotes flowering on remaining branches.





Limbs **A, B, C,** and **D** were *headed back* to side branch. This type of cut promotes vegetative growth mainly at the point of cut.



The Black Persimmon of China

by M. M. Brubaker



Reprinted courtesy of Yearbook U.S. Dept. of Agriculture 1911.

Fruit of the lotus flower persimmon. A form from Chihli, China, with striking fruits which are quite seedless. This oriental form was introduced in the United States in 1911.

The Chinese consume a number of fine fruits that are unknown or little appreciated in this country. One example is the small black persimmon, *Diospyros lotus*, which *Hortus Third* calls the date plum. It is not related to either the date or the plum, and its flavor suggests neither of these common fruits. Horticultural reference books that list *D. lotus* give little or no indication that it is a desirable fruit and commonly suggest its only value is use in China as a root stock on which the oriental persimmon *D. kaki* is grafted.

Diospyros lotus probably has about the same range of hardiness as our native persimmon, *D. virginiana,* which includes much of New England, New York and Pennsylvania. It is supposed to have winter cold requirements about like the peach. I have seen no suggestion that *D. lotus* would make a good yard tree, but our rather limited experience indicates it should be much more generally planted by fruit lovers.

My family enjoys very much the fruit of *D. lotus.* Our two young trees yield good quantities of fruit in late fall. The berries are about the same size as small cherries. They become sweet and non-astringent when they turn black. The fruit can be used for casual munching, or it makes a very nice dessert in a bowl with cream. No doubt the fruit would adapt to use in cakes, puddings, and custards, as recommended in USDA Bulletin No. 685 for the native persimmon, or as suggested for the oriental persimmon in West Coast cuisine magazines. The fruit is easily preserved by freezing or drying. In fact, the fruit left hanging on the tree dries, shrivels, and can be used like raisins.

The sex habits of *D. lotus* are not very clear. It is supposed to be dioecious, and one authority reported that it did not bear parthenocarpic fruit like the common oriental persimmon. Nevertheless my two bearing trees, which grew up from seedlings, bore seedless fruit for three years. I thought I had two female trees until this year when part of the fruit has been larger and contains seeds. It looked as if at least one of the two trees bore some male flowers. It is very unlikely that the male parent was one of my male native persimmons. I had tried on a number of occasions in past years to cross *D. lotus* and *D. virginiana* and failed.

I expect that *D. lotus* can never be appreciated in its present form in this country since the fruit is small and lacks an exciting appearance. Nevertheless, I hope that a few ardent horticulturists who are fruit lovers will undertake an improvement program. Frank Meyer, a Dutch plant explorer who worked for USDA, wrote in USDA Bulletin No. 204 "Agricultural Explorations in the Fruit and Nut Orchards of China" about interesting variations of *D. lotus:* "...the trees vary considerably in productiveness, size, and color of the fruit. Near Changli there are a few trees that have decidedly elongated berries, covered with a bluish bloom and very sweet to the taste. In the Pangshan district there are one or two trees bearing globular fruit, which is perfectly seedless; and in the mountains southwest of Pautingfu, small, yellow-fruited varieties are occasionally found."

Frank Meyer brought back a number of these variations for trial in this country by the USDA. I hope my enthusiasm will stimulate others to search out and grow these trees.

Source for *Diospyros lotus*

J. L. Hudson Seedman
P.O. Box 1058
Redwood City, CA 94064

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In addition to being an enthusiastic grower of orchids, vegetables and black persimmons, M. M. Brubaker has enjoyed growing exotic fruits including jujube, other persimmons, the medlar, pawpaw and figs.

Reprinted courtesy of Yearbook U.S. Dept. of Agriculture, 1911

CONTROLLING FRUIT INSECTS & DISEASES

by James J. McKeehen

To spray or not to spray is a question most home gardeners must deal with when growing tree fruit or small fruit plants. It seems most years the insects and diseases have the upper hand. In order to produce nearly blemish-free fruit and high yields, the home fruit grower must use both cultural and applied control measures. Cultural controls offer some suppression of certain diseases and insects, while other pest problems can only be reduced using a regular chemical pesticide spray program.

pesticides

The spray schedules provided here for apple and peach trees cover one full growing season. Following the spray schedule will insure the production of reasonably clean homegrown fruit. The pesticides cited have moderately low mammalian toxicity and degrade soon after application (seven to ten days, depending on weather conditions). Little or no toxic residues remain either on the fruit or in the environment when the schedule is adhered to.

continued



photos by James McKeehen

Apple maggot. Apple cross section shows internal maggot damage.



Apple scab, a fungus disease on apple

cultural pest reduction recommendations for tree fruits

Activity	Controls
Remove all fruit from tree after final picking.	fungi and insects
Prune to permit light and spray penetration throughout the tree.	insects and diseases
Keep weeds and organic mulches away from tree trunk.	animals and diseases
Mulch the base of the tree with finely crushed stone and/or stone chips for about a foot out from trunk.	animals and diseases
Prune stone fruit trees (peach, nectarine) in April or May, after fruit set	fungus diseases and winter injury
Don't over-fertilize.	winter injury
Prune and remove all dead and diseased branches.	diseases
Where feasible remove all of previous year's leaves from area under tree.	fungus diseases
Remove all fallen fruit under tree.	fungus diseases
Grow varieties adapted to the Delaware Valley area.	
Identify insects and diseases that are detrimental to tree fruit you are producing and spray only those that will destroy and/or reduce fruit yields.	
Investigate nearby properties for tree fruits similar to yours. Also determine if any insect or disease program is being followed. If the neighbors are not controlling their pest problems, your job becomes more difficult.	

CONTROLLING FRUIT INSECTS & DISEASES continued

A number of general purpose fruit tree pesticide mixtures (GP Mix) are available at garden centers. A GP Mix usually includes one or more insecticides and fungicides. It may also include a miticide. This type of mixture offers fair control of fruit tree pest problems, provided the amount used, the application method, and timing are correct. The GP Mix permits the purchase of one pesticide package instead of several, which require mixing as indicated in the printed spray schedule. Regardless of which spray program is followed, GP Mix or individual products requiring mixing, always follow the directions on the product when mixing and applying pesticides.

Thoroughly spraying the entire plant (branches, foliage and fruit) is necessary for satisfactory pest control. An apple tree 12 to 15 ft. requires about five to seven gallons of spray solution. A peach tree 7 to 9 ft. takes about three to four gallons of spray.

APPLE SPRAY SCHEDULE

The following spray schedule will not provide desirable disease control during wet seasons. During the time of "Green Tip" through and including "Second Cover," apply sprays every seven days if scab is to be controlled during wet weather.

Do not use an insecticide in the sprays applied during the bloom season.

Time to spray	Material for 2.5 gal. spray	Pests to be controlled
Green Tip Green Tip should not exceed ¼ in.	1.5 C Miscible Superior Oil and 1 T Benlate 50% WP	Scales, mites, scab, powdery mildew
*Prepink First pink color of flower buds	GP Mix; or 5 T captan 50% WP and 3 T Imidan 50% WP or 7.5 T Imidan 12.5% WP and 1 T dimethoate 2/67 EC**	Scab, aphids, caterpillars, scales, rust, powdery mildew
*Pink Just before blossoms open	Same materials as Prepink	Scab, aphids, rust, scales, powdery mildew
*Petal Fall 90% of flower petals off	Same materials as Prepink	Scab, curculio, caterpillars, aphids, scales, rust, powdery mildew
*First Cover 14 days after Petal Fall	Same materials as Prepink	Same pests as in Petal Fall
*Second Cover 18 days after First Cover	GP Mix; or 5 T captan 50% WP and 3 T Imidan 50% WP or 7.5 T Imidan 12.5% WP	Scab, caterpillars
*Third Cover ***Early July	Same materials as Second Cover	Scab, fruit rots, worms, apple maggots, mites, powdery mildew
*Special Maggot ***Mid-July	Same materials as Second Cover	Same pests as above plus sooty blotch and flyspeck
*Fourth Cover ***Late July	Same materials as Second Cover	Same pests as above plus sooty blotch and flyspeck
Fifth Cover ***Mid-August	Same materials as Second Cover	Same pests as above plus leaf rollers, sooty blotch, and flyspeck

WP - Wettable Powder **T - Tablespoon** **C - Cup** **EC - Emulsifiable Concentrate**

Benlate (Benomyl) can be used in place of captan throughout the season.

*Where powdery mildew is a problem, add 2 T of wettable sulfur in Prepink through Fourth Cover sprays. If Benlate is used, sulfur will not be needed.

**Dimethoate = Cygon, Defend, Rebelate

***Folpet (Phaltan) 50% WP may be substituted for captan in these sprays. Use 5 T for each 2.5 gal. of spray. Mites: if mites develop, add 1 T Plictran 50% WP or 2 T Kelthane 35% WP in each of next two cover sprays.



Apple insects. Small fruit, plum curculio destroying fruit; large fruit, coddling moth destroying fruit.



Peach brown rot, a fungus disease

PEACH AND NECTARINE SPRAY SCHEDULE

This schedule will not provide desirable control of brown rot unless Benlate (Benomyl) is used in addition to the fungicide in the GP Mix, or in addition to captan. (Use 1 T, 50% WP Benlate per 2½ gals. of water.)

Time to spray	Materials for 2.5 gal. spray	Pests to be controlled
Dormant Before green	5 t copper sulfate and 7 T spray lime and 1 C Miscible Superior Oil	Leaf curl, scales, mites
Pink Just before blossoms open	GP Mix; or 3 T Imidan 50% WP or 7.5 T Imidan 12.5% WP and either 1 T Benlate 50% WP or 5 T captan 50% WP	Brown rot, aphids
Bloom	1 T Benlate 50% WP plus 5 T captan 50% WP	Brown rot
Petal Fall	Same materials as Pink	Brown rot, fruit moth, bud moth, curculio
Shuck Fall When most shucks* have fallen	Same materials as Pink	Same as above plus scab
First Cover 14 days after Shuck Fall	Same materials as Pink	Same as above
Before Harvest 3 weeks before harvest	Same materials as Pink	Brown rot, leaf spot, fruit moth, maggot, Japanese beetle
One week before harvest and during harvest	5 T captan 50% WP or 1 T Benlate 50% WP	Brown rot

WP - Wettable Powder **T - Tablespoon** **t - teaspoon** **C - Cup**

*The plant tissue covering the immature peach fruit.

Mites – If a mite problem develops, add 2 T Kelthane 35% WP in two consecutive cover sprays.

Peach Tree Borer – On bearing and nonbearing trees, protective and preventive trunk sprays should be applied each summer. Use Lindane 20% liquid, 1 tablespoonful per 1 gallon of water. Apply 1 pint per tree for small trees and 1 quart per tree for large trees. Apply to the trunk from the lower scaffold branches to the soil line. Soak bark to run-off. Do not apply borer sprays to fruit or foliage. Make two applications (July 20, August 20) each year if borers have not been troublesome and three applications (July 15, August 5, August 25) if trees show symptoms of borer infestations.

raspberry and blackberry spray schedule

Spraying raspberries and blackberries is desirable if the home fruit grower wants good yields and a long-lived stand of plants. Cane blight diseases and viruses, if uncontrolled, will quickly reduce yields and thin plant stands in a matter of several seasons. The dormant (blackberries) and/or delayed dormant sprays (raspberries) are the keystone sprays to success for brambles.

continued

RASPBERRY AND BLACKBERRY SPRAY SCHEDULE

The important insects and diseases to be controlled, except for viruses, are listed.

Time of spray	Materials for 2.5 gal. spray*	Pests to be controlled
Dormant** (blackberries only). Before buds open	2.5 C lime sulfur, 29 to 31%	Anthracnose, cane blight, powdery mildew, rust
Delayed Dormant*** Just as buds begin to open	4.8 C lime sulfur, 29 to 31%	Anthracnose; spur blight on raspberries; powdery mildew, rust, and cane blight on blackberries
New Shoots 8 inches long	5 T captan 50% WP and 5 T methoxychlor 50% WP	Anthracnose; botrytis, cane blight, and spur blight on raspberries; fruit worms, beetles
Petal Fall	5 T captan 50% WP and 5 T methoxychlor 50% WP and 6 T malathion 25% WP	Anthracnose; botrytis, cane blight, and spur blight on raspberries; fruit worms, rose chafer, aphids, mites
Pre-Harvest	5 T captan 50% WP	Fruit rots
Mid-Harvest	5 T captan 50% WP	Fruit rots
Late Fall Dormant	1 C lime sulfur, 29 to 31%	Cane blight on raspberries

WP - Wettable Powder **C - Cup** **T - Tablespoon**

*2.5 gal. of lime sulfur or captan solution will treat 436 sq. ft.

**The most important spray for blackberries.

***The most important spray for raspberries.

cultural pest reduction suggestions for raspberries and blackberries

Activity	Controls
Do not plant where brambles, strawberries, tomatoes, eggplant, peaches, peppers, or potatoes were grown recently.	*Verticillium* wilt
Avoid planting in areas near wild brambles and old cultivated plantings.	viruses
Use only certified "disease-free" or disease-resistant plants.	viruses, cane blights, crown gall, nematodes
Remove fruited canes immediately after harvest.	cane blights
Pinch or tip new canes when the weather is to be dry for several days. On red raspberries do this during pruning time in late February or March. On black and purple berries, during the growing period, April, May or early June. **Do not tip red raspberries.**	cane blights
Prune off and dispose of all dead and broken canes.	
Don't plant too close.	cane blights
Keep weeds and sod pulled away from plants.	cane blights
Don't overfertilize.	winter injury
Identify insects and diseases that are detrimental to brambles and spray when necessary.	

Fruit Guide Available

The *Fruit Production Guide for Home Gardeners* is a complete home fruit growing booklet available from your county agricultural agent. The publication covers fruit variety selection for Pennsylvania; planting, spacing and yield guides; fertilization and pruning directions; pollination information; harvesting suggestions; and complete insect and disease spray schedules for apples, pears, quince, peaches, nectarines, cherries, raspberries, blackberries, blueberries, grapes, strawberries, currants and gooseberries, and more. The booklet can be obtained in Pennsylvania counties from your Cooperative Extension Service Office, usually located in the county seat, for $1.50 per copy.

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Jim McKeehen is the Delaware County agricultural agent for the Cooperative Extension Service, College of Agriculture, Pennsylvania State University. He is a frequent contributor to *Green Scene*.



MARKETING PICK-YOUR-OWN

by Bradshaw Snipes

As a marketing process "Pick Your Own" may be planned a few months to five years in advance of the actual harvesting of the crop. Quite likely, though, one stumbles onto P.Y.O. when other methods of selling are inadequate.

The compelling desire to work the bountiful soil, to grow a crop, usually impels one to grow far more than neighbors or a few nearby stores will buy. Selling to the wholesale distributors is often hopelessly unprofitable. Often people like to grow crops as a sideline to other employment. So they plant a half acre of strawberries, three acres of Christmas trees, or an acre of apples. Harvesting and selling will come later.

So regardless of the reason for growing, the crop does grow. The best crops are sprayed, weeded, and tilled. Hope builds as the harvest time approaches: "I wonder what it will be like to see red berries lying all over the patch, peaches weighing down the limb, the Christmas trees growing ever so slowly, six to twelve inches per year?"

Within weeks of the harvest, butterflies begin to flutter in the stomach, and one lies awake at night thinking of all the details to be attended to: signs, newspapers ads, parking space, people or crowd control, cash box, scheduling the responsibility of family members. An entreprenuer is born.

Overlooked, but what seems to come naturally is the friendly public relations that is missing in so many businesses. The family is a natural to run a P.Y.O. business; the more the merrier.

how we got started

Snipes Farm and Nursery got into P.Y.O. after other marketing attempts proved disappointing. Twenty acres of peaches and two acres of strawberries produced too much to expect to sell it all at the roadside stand. In the 1950s grain farming and livestock farming were on the skids and so was growing truck crops on a contract basis. So fruit growing would keep us on the road to a new utopia. In desperation the old trucks were fitted with sides and floor boards to carry layers of overflowing baskets of tree ripe fruit to Philadelphia, to Dock Street and the new Food Distribution Center. We arrived with great expectations about sundown, unloaded the baskets on the warehouse floor, and left them there for consignment sales. The next morning when we phoned to Philadelphia the proprietor told us all the reasons why he could get only 50¢ a basket for our fruit. What a letdown. The baskets cost 25¢ in those days; the picking cost 40¢; the stacking on the truck cost 10¢; and we hadn't even calculated the growing costs! One thousand quarts of strawberries brought only 5¢ a quart at Dock Street; that's why Snipes Farm and Nursery got into P.Y.O.

One thousand quarts of strawberries brought only 5¢ a quart at Dock Street; that's why Snipes Farm and Nursery got into P.Y.O.

Once the public knew we were in the P.Y.O. business, they picked all our produce. They would park under a shady tree and have quite a picnic. For peach picking they would have to park in the pasture and then walk through three-foot gates in the fence; and that's right where the cash-taker would station himself.

some hazards of picking

We had more exciting experiences in the peach orchard than in the strawberry patch up behind the barn. Because of the relationship of the pasture and the peach orchard there were always animals to consider. Just before the daily opening, the family cow and horses were supposed to be driven to the second pasture so they wouldn't go through the open gates, but you can be sure that one day out of three something didn't quite work. Usually our children were a little late in moving the animals. Our cow always had great curiosity about shiny cars, especially Cadillacs. She would walk up to them, put her head inside the window or lick the fenders and the windshield. Sometimes the horses would get separated, which usually meant one of them broke through a fence, galloping and neighing as he went right through the orchard. The pickers, frightened half to death, would part from that horse's trail like a comb parting a head of hair. Near sunset one night as the orchard was closing one family insisted on picking just two more baskets. They didn't know that a black angus cow had gotten out. When the cow walked by the tree where the family was picking there was a terrible scream. The family came running out of the orchard, minus the peaches, shouting that there was a big black bear in the orchard.

a family affair

Selling the peaches or strawberries has always been a family affair. One or two of our children could handle it well, working from 5 P.M. until 8 P.M. By fourth grade they could handle their math and make change. Our youngest daughter at age six could master horseback riding quite well. And this was our answer to keeping pickers on the right rows. It seemed that someone always wanted to jump a row and pick peaches two weeks too green for their own good. So Anne would ride up and down the rows keeping the pickers where they belonged.

We met wonderful people in our fields. Some wanted cheap produce; some came out to recapture the memory of when they were raised on a farm. They wanted their children to have something of that experience also. A great many displaced persons from Europe who lived in Trenton came out. It was a good place to practice speaking German, and my brother would also try out his Polish or Ukranian language skills. An older man and woman would periodically walk two miles out from Trenton, pulling their express wagon. They would never come at the proper picking hours, and we never felt we could turn them down, even though someone had to stop what they were doing to get them to the proper row. Sometimes we would drive them back to Trenton after they had picked and were tired. Another lady who confessed her age at 79 years would drive ten miles down from Newtown and pick about ten baskets. She said she didn't care to eat them much, but she just picked for her friends. Some of the rows were 350 yards long. She would carry baskets weighing 30-35 pounds the length of the rows. I marvelled at her

continued



Raspberries at Highland Orchards



Pickers at the starting line at Highland Orchards in West Chester, Pa.



The picking public has arrived.

photos by Joseph Way

energy. The only time she let me help carry them out was when a thunderstorm was approaching.

We had some bad experiences, too. Occasionally someone would try to cheat our children or fill the baskets too full. That is a ticklish situation when trying to decide when a basket is full. If it is too full, peaches roll off onto the ground while being carried in. Then there are the grandmothers who come with huge aprons. There is a certain way they can drape and tuck in the edges of the apron around the top of the half bushel basket so it will hold a bushel of peaches. We never worried about how much produce a family ate, but sometimes we were incensed when someone tried to take advantage of a good situation. Whenever my brother Sam came around to help, his legal training just wouldn't let him accept a picker who was trying to cheat a farmer who has a hard enough time making ends meet. He would tell them off. This "fullness" problem has in recent years been resolved by selling all produce by the pound. Usually the price is about half of the retail price in stores.

Growing any of these crops, including a new 12 acres of dwarf apples on trellises, is an exacting business. It is fun to try something new, like the dwarf apples. We had to learn whole new areas of expertise. Our children fresh out of college, along with nursery help, mastered the tile laying, planting the trees, installing the posts and drilling holes in them through which to draw wire, continuous pruning, and attaching the new shoots to the wires. We placed about a bushel of gravel around each tree to prevent mice from digging down to get to the bark of the delicious M-26 dwarf root stock, and rabbit guards were placed around each tree. The trees are placed 8 ft. apart in the row and the rows are 12½ ft. apart.

This placement creates a rather

dense orchard of about 450 trees to the acre, and is in contrast to a conventional orchard in which the standard trees are placed on a grid 20 ft. by 30 ft., or even farther apart. A yield of from one to two bushels of apples per M-26 tree should be in the offing four or five years after planting. A standard tree will take 8 to 15 years to bear a heavy crop and probably will not produce as many bushels per acre as a dwarf tree. To produce 1,000 bushels per acre, a dwarf M-26 root stock apple tree would have to produce 2.2 bushels per tree, and a standard tree would have to produce 15.2 bushels per tree. (See "What Would Johnny Appleseed Think?," page 34.)

In the final analysis, however, the excitement is in the growing whether it is nursery stock, flowers, or produce. It is a realization that everything we are, that our civilization is, has come from the sun and the good earth. We must always remember this. We are part of this growing cycle.

Where to Find "Pick Your Own" Farms in Your Area

The Cooperative Extension Services of the state universities have prepared pamphlets or booklets listing pick-your-own farms. Contact:

Cooperative Extension Service
The Pennsylvania State University
Southeast Corner, Broad and Grange Streets
Philadelphia, PA 19141

Cooperative Extension Service
Cook College
The State University of New Jersey
Rutgers Campus of New Brunswick
New Brunswick, NJ 08901

Cooperative Extension Service
University of Maryland
Symons Hall
College Park, MD 20742

Mark Kooper
Executive Assistant
Delaware Dept. of Agriculture
230 Agricultural Hall
University of Delaware
Newark, DE 19711

Starting a Pick-Your-Own Market

In Delaware, publication *Management of Pick-Your-Own Operations* (charge of $2.50 as long as supply lasts) and/or slide set, Roadside and Pick-Your-Own Marketing, can be obtained from:

University of Delaware
County Extension Service
230 Agricultural Hall
University of Delaware
Newark, DE 19711

Directory: *Directory of Roadside and Pick-Your-Own Operations*
(Same address)

In Maryland, publications on Management and Area Roadside Markets have been sent to all local public libraries and can be obtained from local county extension offices.

In Pennsylvania, write to:
Larry Yeager
Area Marketing Agent
999 Lincolnway West
Gettysburg, PA 17325
Phone: 334-6271

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Brad Snipes is a nurseryman and farmer. He has been on the PHS Council for six years. He is a member of the J. Franklin Styer Award Committee, which evaluates plants showing promise of exceptional garden merit. Snipes is a director of the Pennsylvania Nurserymen's Association, and chair of the PNA Garden Center Committee.

ALL ABOUT FRUIT

The PHS librarian recommends:

growing:

The Complete Book of Edible Landscaping. Rosalind Creasy, San Francisco, Sierra Club Books, 1982.

The Complete Guide to Growing Berries and Grapes. Louise Riotte. Charlotte, VT, Garden Way, 1974.

The Fig. Ira J. Condit. Waltham, MA, Chronica Botanica, 1947.

Growing Unusual Fruit. Alan E. Simmons. NY, Walker & Co., 1972.

Landscape You Can Eat. Allen A. Swenson. NY, David McKay Co., 1977.

Nuts for the Food Gardener. Louise Riotte. Charlotte, VT, Garden Way, 1975.

Nut Tree Culture in North America. Richard A. Jaynes. Hamden, CT, Northern Nut Growers Assoc., 1979.

Persimmons for Everyone. Eugene Griffith and Mary E. Griffith. Arcola, MO, North American Fruit Explorers, 1982.

Potted Orchards: Growing Fruit in Small Spaces. Allen F. Simmons. London, David & Charles, 1975.

Simon & Schuster's *Step-by-Step Encyclopedia of Practical Gardening: Fruit.* Harry Baker. NY, Simon & Schuster, 1980 (Royal Horticultural Society's *Encyclopedia of Practical Gardening* series).

Successful Berry Growing. Gene Logsdon. Emmaus, PA, Rodale Press, 1974.

pruning:

All about Pruning. Ortho Books, San Francisco, Chevron, 1978.

How to Prune Almost Everything. John P. Baumgardt. NY, Burrows, 1968.

The Lorette System of Pruning. Louis Lorette. Rev. ed., London, John Lane, 1946.

Pruning Apple Trees. C. R. Thompson. London, Faber & Faber, 1966.

Pruning: Roses, Deciduous Shrubs, Evergreens, Hedges, Wall Shrubs, Fruit Bushes and Trees. Christopher Brickell. NY, Simon & Schuster, 1979. *(Step-by-Step Encyclopedia of Practical Gardening* series)

preserving:

The How to Grow and Can It Book. Jacqueline Heriteau. NY, Hawthorn, 1976.

Putting Food By. Ruth Hertzberg, Beatrice Vaughan, and Janet Greene. Brattleboro, VT, 05301

Preserving the Fruit of the Earth. Stanley Schuler and Elizabeth M. Schuler. NY, Galahad, 1973.

sources:

Bountiful Ridge Nurseries
Princess Anne, MD 21853
fruit trees, berries, grapes

Buntings Nurseries, Inc.
Selbyville, DE 19975
berries, nut trees, fruit trees

Hilltop Orchards & Nurseries, Inc.
Rt. 2
Hartford, MI 49057
800-253-2911
fruit trees

Leuthardt Nurseries, Inc.
Eash Moriches
Long Island, NY 11940
dwarf fruit trees, espalier fruit trees

New York State Fruit Testing Cooperative Assoc., Inc.
Geneva, NY 14456
315-787-2205
introduces & tests news fruits
apples, pears, nectarines, apricots, grapes, currants, gooseberries, elderberries, plums

Owen's Vineyard & Nursery
Georgia Highway 85
Gay, GA 30218
404-538-6983
grapes

Preservation Apple Tree Co.
P.O. Box 279
Mt. Gretna, PA 17064
717-964-2229
rare apple varieties (including antique & modern)

Stark Bro's
Louisiana, MO 63353
fruits, berries

Tollgate Gardens
20865 Junction Rd.
Bellevue, MI 49021
616-781-7402
pawpaws

Bob Wells Nursery
P.O. Box 606
Lindale, TX 75771
fruit trees, persimmons, figs, nut trees

The Leslie H. Wilmoth Nursery
Rt. 2, Box 469
Elizabethtown, KY 42701
502-369-7493
"northern" nut & fruit trees
old world apple varieties



An Ancient Delicacy for Delaware Valley

by Charles O. Cresson

My first introduction to fresh figs was as a teenager visiting a friend's grandmother in South Carolina. The most outstanding part of a delicious meal was the glass dish of chilled and peeled fresh figs served for dessert. The smooth delicate flavor and almost syrupy sweetness created a life-long craving. Whether they had come from a local market or from her own garden is immaterial; being so perishable, they were certainly of local origin.

Since then I have enjoyed fresh figs directly from the tree in my own garden. Peeling isn't necessary since the skin is quite soft. For friends who have never tasted them, a fresh fig is the most memorable part of a visit to the garden. A fruit such as this is indeed worth the extra effort required in our climate.

In suitable climates figs can literally grow like weeds, even springing up along railroad tracks in Italy. They can form small trees or large shrubs. Being sensitive to frost, the large palmate leaves are deciduous in winter. Without protection, the wood is hardy in zones 7-8. They love heat and are tolerant of drought and poor soils.

Figs are also quite variable in leaf shape, fruit and hardiness. Red, white, and black fruit are available depending on the variety.

The fruit, born at the nodes along the stem, is actually a swollen receptacle surrounding tiny flowers that line the narrow cavity through the center.

varieties

Most varieties of figs fit into one of three categories:

The capri fig *(Ficus carica sylvestris)* is the inedible sort that grows wild on hillsides in Asia Minor. It provides pollen and a breeding place for the essential fig wasp, *Blastophaga*. Upon reaching adulthood, these tiny nonstinging wasps acquire a cargo of pollen as they crawl out the narrow central passage of the fruit. Pollination is completed as they enter the fruit of an edible variety to lay their eggs.

The smyrna fig *(F. carica smyrniaca)* is the type with which most of us are familiar. The seeds give the familiar dried figs and fig bars their nutty flavor and crunch. In order to develop fruit, cross pollination with the capri fig is essential. The capri fig, from which the wasp will emerge, is either grown in the orchards or cut branches are hung among the trees. Three crops are produced each year. Unfortunately they are not hardy in the north, but smyrna figs are grown in southern Europe, the Middle East, and California.

Of interest to us as northern fig growers is the common fig *(F. carica hortensis)*. The fruit requires no pollination and contains no seeds. Some growers may get two crops but without a greenhouse, our season is only long enough for one, which ripens from late August to frost. Even so, the sunnier and hotter the location, the better.

The only alternative is to bend over and bury the entire plant. I can assure you that this method gives excellent results. Although it sounds like a traumatic experience for a fruit tree, remember what a weed the fig really is.

Actually figs are one of the easiest fruits to grow. They have few disease problems and do not require spraying. Almost any soil will suit them and they grow rapidly. Sun is the primary requirement. The unavoidable problem is hardiness. But with a simple understanding of the factors affecting hardiness this problem can be easily overcome and reliable crops can be assured.

The two most important strategies in dealing with hardiness concern selecting the proper varieties and winter protection. Unless a nursery specifies the variety of fig offered, it is inadvisable to purchase from that firm. Years ago I acquired my first fig from a neighbor who had bought an anonymous variety. In the more than 10 years I've had it, this variety has not proven hardy except with exceptional trouble and even then has never borne a single fruit. Suitable varieties are adapted to the north in other ways than simply hardiness. Incidentally, that neighbor never tried again.

I know of two other local growers who have abundant crops each year. Their plants easily reach 12 ft. in height and must be cut back in order to wrap them. Space in my garden has limited me to two plants propagated from these growers. I believe that one of these varieties is 'Brown Turkey' and was told that another is 'Magnolia.' Both of these have proven hardy and have borne fruit although still young.

Probably the hardiest and most commonly offered cultivar is 'Brown Turkey.' Other varieties that may have better quality fruit and are recommended for hardiness are 'Kadota,' 'Osborne Prolific,' 'Black Mission,' 'Celeste,' and 'Magnolia.' 'Kadota' has a small eye at the end of the fruit, which is often closed, and which excludes ants and other insects from the sweet flesh inside. This is not the case with many other varieties.

Of course the most certain way to obtain hardy varieties is to search out local growers and to ask for cuttings. An enthusiastic grower will usually have more than one variety. Often these varieties are not named cultivars as such but rather are descended from plants brought over by Italian immigrants and shared with neighbors. An interesting selection of fruit types can be obtained in this way.

propagation

Propagation is so simple that no one should be discouraged from doing his own. The easiest method is to insert dormant 6-in. hardwood cuttings up to the top bud in a well aerated rooting medium in a cold frame. This should be done in the autumn and growth will begin in the spring. No rooting hormone is necessary. Cuttings can even be rooted outdoors if the soil is well enough aerated and a heavy protective mulch is applied for the winter. Layering and air-layering are also successful.

winter damage

North of Maryland, some sort of protection is a must in all but the mildest winters; otherwise the plants will die back to the ground each year and not produce fruit.

The single most important cause of winter injury is low temperature. How-

photos by Charles O. Cresson



Ficus carica in fruit



The author's fig is wrapped for winter protection.



Figs next house are covered for winter with leaves and tarpaper. This photo was taken in October.

ever, it is very important to realize that lower temperatures can be endured if the plant is protected from rapid temperature change.

Damage to fig branches begins at about 15°F. Since hardiness of most plants increases as the day length shortens, I wait as long as possible before covering my figs, usually about Thanksgiving. Once in the dark, theoretically, the plants will not develop further hardiness.

Protection from rapid temperature changes and dehydration greatly contribute to the ability of plants to survive cold temperatures. Beating sun on a cold winter day can do serious damage to exposed twigs as can cold, dry winds.

Figs are protected from these extremes by either wrapping or burying the entire plant. In both cases, the branches are drawn up and tied into as narrow a form as possible. It may be necessary to reduce some stems to a reasonable height. In pruning encourage multistemmed shrubs by removing the oldest and tallest trunks.

wrapping and burying for winter

In the case of wrapping, the objective is to provide a dry insulating layer around the plant. It must remain dry all winter or the insulating qualities of the material will be lost. Various methods include the use of layers of burlap or even great wads or layers of newspaper. (Several editions of the *Sunday New York Times* will be required.) Finally a waterproof covering of tar paper or plastic film is applied. We use cylinders of chicken wire lined with tar paper. These cylinders can be stacked up, the upper overlapping the lower, and filled with dry leaves, pine needles, salt hay, or any suitable insulator. A plastic bag is tied over the top. Dupont C-Foam and Microfoam are reported to provide excellent results although I have never tried these products.

In the Delaware Valley wrapping provides sufficient protection in all but the coldest areas. I am convinced that its value lies not in the exclusion of the cold but rather the protection from rapid change and harsh weather conditions, although the coolest night temperatures will probably never penetrate provided they are of short duration. During January 1981, we measured several nighttime lows of -9°F in the garden next to the wrapped figs and still harvested fruit the following summer.

For those localities where stronger measures are required, the only alternative is to bend over and bury the entire plant. I can assure you that this method gives excellent results. Although it sounds like a traumatic experience for a fruit tree, remember what a weed the fig really is. The roots are simply loosened, either all around or on just two sides; those remaining acting like a hinge, and the plant laid down horizontally. Cover the entire plant with soil and mulch and a waterproof cover. Remember that the branches are more pliable on warm days.

Perhaps the greatest encouragement I can give to prospective fig growers is that if they do everything right, they can pick their first crop (though admittedly small) in the first year. Of how many tree or bush crops is this true? Of course as one's craving for this special fruit increases, so does the size of the crop with each successive season. While my own trees are still young and I enjoy only a few figs, friends in the area have harvested several hundred figs from their trees in a given year.

Reading

"Figs in the North," Jack Ruttle. *Organic Gardening*, Dec. 1981, pp. 62-66.

Sources of Figs

Armstrong Nurseries
P.O. Box 4060
Ontario, CA 91761
4 varieties

Bountiful Ridge Nursery
Princess Anne, MD 21853
4 varieties

The Fig Tree Nursery
P.O. Box 124
Gulf Hammock, FL 32639
9 varieties.
(Send legal size self-addressed envelope.)

Wayside Gardens
Hodges, SC 29695
'Brown Turkey' only

All of the above sources except Wayside Gardens came from the article in *Organic Gardening*, Dec. 1981.

●

Charles O. Cresson is horticulturist at The Nemours Foundation, former estate of Alfred I. duPont in Wilmington, Delaware. Cresson received a degree with a major in horticulture from the University of Vermont and spent three years studying horticulture in England. An avid gardener, Cresson concentrates on perennials, bulbs and half-hardy plants among other things in his private garden.

The gates of the deer fence are opened for the tractor to haul out the stacked crates of apples. Each crate holds a bushel.



photos by Edmund B. Gilchrist, Jr.

WHAT WOULD JOHNNY APPLESEED

Espaliered Dwarf Apple Trees

Imagine 2,000 dwarf apple trees espaliered on trellises, their outstretched limbs a froth of blossoms, their trunks wrapped in blush-pink protective "stockings." A *corps de ballet* painted by Degas leaps to mind.

Pennsylvania State University and the Delaware Valley College in Doylestown encouraged us to plant such an orchard. Because land on the exurban fringes like Bucks County seems destined to sprout "town houses" rather than edibles in the not too distant future, the agronomists recognize that the establishment of a standard orchard, which requires eight or nine years to achieve full production, is no longer an enticing investment. On the other hand, dwarf trees grown on low trellises can repay initial costs in half that time.

The concept was pioneered in the smaller countries of Europe decades ago to conserve space. Whereas one acre generally accommodates 64 standard apple trees, with the espalier method, that same acre can host 605 trees – nearly 10 times as many. A harvest of a thousand bushels is not an impossible dream.

Advantages abound. For example, no ladders. There is a saying in the business that with each rung of the ladder the quality of fruit drops by a bushel. Bruises on the apples (not to mention those on the picker!) multiply, the higher the climb. Harvesting with both feet on the ground, one can expect 90% top quality apples, versus the usual 60%.

Furthermore, irrigation and frost control are easier, and structural damage from acts-of-God like ice storms is minimal. Color, a prime selling consideration, is better on espaliered trees, because the fruit, unencumbered by dense foliage, captures every sunbeam.

The planting of such an orchard is, of course, a major undertaking; planned with the precision of a marching band's maneuvers at half-time. A row out of kilter will produce a frustrating cowlick when the grass between rows is mowed.

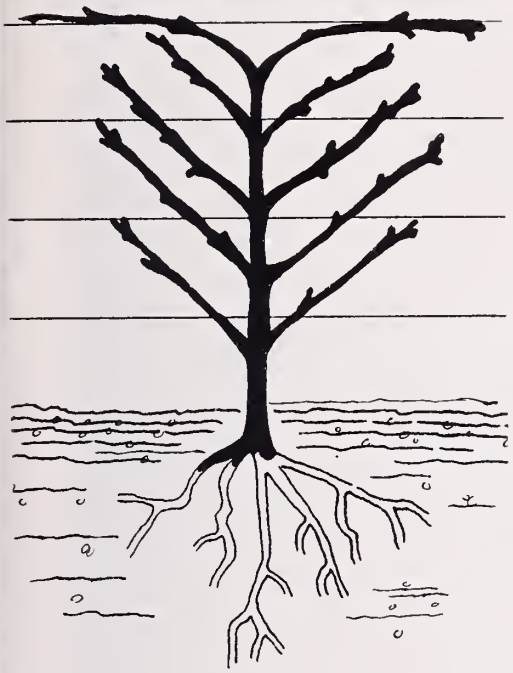
Distance between rows is determined by a formula that encompasses root stock (in our case, Malling 26*), soil type, water table, and the variety of apple grafted. The soil is tested and classified according to productivity: the poorer the soil, the greater the space between trees and supporting posts. Half our rows, accordingly, are spaced 12 ft. apart, the other half 15 ft. Within the rows the trees are 6 or 7 ft. apart.

The end posts are buttressed by guy wires anchored to a steel rod, with a flexible plate buried deep in the ground. To counteract the sag produced by the heavy fruit, the wires terminate in a winch-like arrangement that can be tightened.

The young trees were trained on four wires, the top one at about eye level. The branches were attached with

*This root stock series gets its name from the East Malling Station in England, which developed it. Number 26 refers to the degree of dwarfing.

Oblique palmette design for training fruit trees.



THINK?

by Helen H. Gemmill

notched plastic strips to form the "oblique palmette" design (see illustration). The reason for this fan-like configuration is horticultural rather than aesthetic: the more horizontal the branch, the more fruit it will bear. On the other hand, the more vertical the branch, the more vigorous its growth. Therefore, since the top tends to overgrow the bottom, the upper branches are trained flatter, producing more fruit, and fewer suckers and leaves.

Achieving the desired shape takes about three years, through a combination of vigorous pruning and training. Just as the angle of the branch affects its yield, so does the time of the year when the pruning is done. Pruning in late spring is less stimulating vegetatively than in mid-winter. A late August chop not only controls rampant growth, but helps open the tree to the sun.

The spraying of a trellised orchard is not only easier but more controlled. For this all-important task we acquired a machine from Bordeaux, where it is used to spray the vineyards. With the highest apples only six feet off the ground, and a minimum of leaves and branches intercepting, every drop of spray hits its target. Altogether, the orchard is doused about twelve times a year.

creative strategies for stopping predators

To deter nibblers, the trunks were wrapped in a pink plastic "stocking" that promoted the Degas comparison. Last summer the pink plastic, which gradually unwound, was replaced with white paint. The paint served a dual purpose: the light color reflects rather than absorbs the sun, as the dark trunk would. In spring when the temperature goes from 20° at night to 80° by day, the bark of the trunk is not so likely to crack (and admit bugs and diseases) if it is equipped to withstand the heat of the sun's rays.

Harvesting with both feet on the ground, one can expect 90% top quality apples, versus the usual 60%.

We placed gravel around each root, which improved drainage and reduced chances of root rot. The gravel also deterred rabbits and mice; it did not deter the deer. Picturesque though they may be, Bambi's rapacious relatives have been known to stunt an entire year's growth.

We tried every mythical repellent.

First came the Tasty Tabasco Treatment. Supposedly, deer prefer their hors d'oeuvres bland rather than spicy. Our friendly neighborhood bartender procured the peppery potion for us in gallon-sized containers, and it was sprayed liberally on the succulent young leaves. The scheme worked fine, for a week or so, until the new unsauced greens sprouted.

Next came the Human Hair Hang-up. Our friendly neighborhood barber was persuaded to save his sweepings, which were stuffed into dainty nylon net bags, and tied to the end trees. That, too, worked fine, for three days, until the first downpour washed the hair.

This was followed by the Olfactory Offensive. After an ineffectual assay with foul-smelling bone tar, we read that lion urine was a sure-fire deer (and, I daresay, poacher) repellent. Wondering how a Pennsylvania deer had learned to fear an African lion, we nevertheless telephoned America's oldest zoo. After a pause at the other end of the line, we were informed politely that we could have all we wanted, provided we held the bottle.

In desperation we turned to fencing. There are many theories about that, too. One grower, for example, put up five strands of electric wire, at intervals attaching aluminum packets filled with peanut butter to engage the deer. When the juice was turned on and the deer nibbled, it got a shock and quickly turned its attention to other alimentary delights at a considerable distance from that nose-tingler.

Now that peanut butter has moved from "Staples" into the "Gourmet Department," we opted for a newer variation. It is predicated on two assumptions: that a deer has faulty depth perception, and that given its druthers, the animal would rather crawl through a fence than jump it, surprisingly enough.

Applying this invaluable bit of deer psychology to the fence, the canny counter-attacker outwits the foe with three high-tensile steel wires, charged with low-amperage electricity. The first two are strung up 15 and 45 in., respectively, from the ground; the third is spaced between these two, but – and this is the trick – *three feet to the rear.*

Theoretically, the unsuspecting deer starts to crawl through the first two wires. Even while he is getting a shock, he manages to catch a tantalizing glimpse of that third one. Not sure just how far away it is, he prefers to seek out other green pastures, rather than risk leaping the fence and landing on that third mysterious "hot" wire.

True or not, no deer has yet got trapped in this maze.

Now our apples grow luscious in peace: Idared, Spur Red Delicious, Spur McIntosh, Cortland, Red Rome, Red Stayman, Early McIntosh, and Triple Red Delicious. Spur types were planted because they have more fruiting surface, not just on the terminals.

Marketing the apples is no problem: the local roadside stands sell all we can produce. In this peripatetic age when every American moves once every five years, part of the baggage he/she takes

continued



The proper way to pick an apple is to grasp it in the palm of the hand and give a sharp upward twist. A straight yank can remove next year's bud.

along is the nostalgic memory of Mom's, or Grandma's, favorite variety of apple. Ex-New Yorkers seem to be *afficionados* of Cortlands and Romes. There is a hard core of mid-westerners who are firmly committed to the proposition that green apples are to be cooked, never eaten. Buyers blessed with cold cellars want "keepers," e.g., Idareds, Romes, or Staymans. Crisp, soft; tart, sweet – the debate rages. Consumers who couldn't care less about the variety of their pears or peaches are very particular about their apples. So we grow a broad spectrum.

Even Johnny Appleseed would have to admit, though, that growing apples on trellises is more likely to produce a bumper crop than his random seed planting.

●

Helen Gemmill is a member of the Huntingdon Valley Garden Club and Doylestown Nature Club.





The plastic wrap is removed after several years, and the trunks given a coat of white exterior latex house paint to reflect the sun and prevent cracking of the bark caused by sudden temperature changes.





Apples are sorted by hand for size and quality.

THE green scene

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